The works of that famous chirurgeon Ambrose Parey / translated out of Latin ; and compared with the French, by Th. Johnson ; together with three tractates concerning the veins, arteries, and nerves: exemplified with large anatomical figures. Translated out of Adrianus Spigelius.

Contributors

Paré, Ambroise, 1510?-1590.
Galen.
Hippocrates.
J. G.
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THE WORKES of that famous Chirurgion Ambrose Parey

Translated out of Latine and compared with the French.

by Tho: Johnson.

Wherevnto are added three Tractats 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, *at the Sign of the Mercers Chappell.* 1649.

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THE

WORKS

Of that Famous CHIRURGEON

AMBROSE PAREY,

Translated out of *Latin*, and compared with the *French*,

BY

TH. JOHNSON:

Together with

THREE TRACTATES

Concerning the

Veins, Arteries, and Nerves:

Exemplified with large Anatomical Figures.

Translated out of ADRIANUS SPIGELIUS.

Geo: Rowland MB: de Aylesbury Bucks.

Ne fallare vide, neu quæ sunt parta saluti,
Vertat in exitium, non solers cura medentis.

LONDON,

Printed by *Mary Clark*, and are to be sold by *John Clark* at *Mercers Chappel* at the Lower End of *Cheapside*. MDCLXXVIII.

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To the Right Honourable

EDWARD

Lord *Herbert* of *Cherbury* and *Caſtle-Iſland*,

and one of His Majeſties moſt Honourable Council of War.

My Lord,

IT is not the far-fetcht Pedegree of Noble Anceſtors nor thoſe Honors your Lordſhip deſervedly poſſeſſes, that make me 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 Judgement which ſees into the inner man, which embolden and incite me to ſue for your Honours 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 Publick Fame of Learning and Judgement, 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 Opprobry, out-lives their Fate, 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 Judgment 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 to the ſame Hazard.

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 Publick 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 principal Surgeon to two or three Kings of *France*, he was a man very well verſed in the Writings of the Ancient and Modern Phyſicians and Surgeons, as you may evidently find by ſundry places alledged in his Works. For his Experience or Practice (the chief help to attain the higheſt perfection in this Art) it was wonderful great, as you may collect by his Voyages recorded in the laſt part of his 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 Progreſs in the Art of Surgery. I ſo laid (* ſaid he) the firſt Foundation of this Art in the Hoſpital of *Paris*, being as it were, an ample Theatre of Wounds and Diſeaſes of all kinds, that for two whole Years, during which time I was there converſant, nothing was conſulted of, nothing performed, the Phyſicians and Surgeons being preſent, whereof I was not an Auditor or Actor. There flouriſhed at theſe Times, and yet doth, *Ambroſe Parey*, Principal 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 Chirurgical 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 dutifulneſs and due reſpect acquired his Favour, that he, unleſs I were preſent, and aſſiſting, did nothing (ſuch is his natural gentleneſs 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 trie whether I could draw or borrow any thing from Strangers, which our men wanted, to the fuller knowledge of Surgery. To this purpoſe I travelled over *Germany*, and then for four years ſpace I followed the *Spaniſh* Army in the Low-Countries; whereas I did not onely carefully cure the wounded Souldiers, but alſo heedfully and curiouſly obſerved what way of curing the renowned *Italian*, *German*, and *Spaniſh* Surgeons obſerved, who together with me were imployed in the Hoſpital, 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 Work. I have (ſaith he) ſo certainly touched 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 the Tranſlation, the which, as deſiring more a publick 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 perſuaſions of

ſome of this Profeſſion, chiefly and almoſt wholly perſuaded 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 Kingdom, and the reſt of his Majeſties Dominions, whoſe good and increaſe in knowledge may be wiſhed, that ſo they may be the better enabled to do good to ſuch as ſhall implore their aid in their Profeſſion.

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 reaſons which I think may ſatisfie any but the purpoſely malicious. The firſt is drawn from the *goodneſs* 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 cuſtom 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 farther, 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 days, 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 leſs 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 Books: ſo that unleſs they have had ſome inſight in the Art, and be in ſome ſort acquainted both with the terms 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 nature, they become Surgeons, I muſt needs liken them (as *Galen* doth another ſort of men *) to Pilots by Book onely: to whoſe care, I think none of us would commit his ſafety at Sea; nor any any if wiſe, will commit themſelves to theſe at Land or Sea either, unleſs wholly deſtitute of other.

Vid. Aul. Gel. l. 2. c. 4.

Gal. de Simp. l. 6.

The other things whereof I muſt 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 *Bauhine*, which were uſed in the Work of Dr. *Crook*; and theſe indeed are the better and more compleat. Alſo *pag.* 519. I thought it better to give the true Figure of the Helmet flowered *Aconite*, mentioned out of *Pliny*, than to reſerve the feigned Picture of *Matthiolus* which in our Author was increaſed 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 limit [ ] 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 Apology and Voyages, being the laſt part of this Work, and not in the Latin, but French Editions, 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 withal 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 happineſs,

Thomas Johnſon.

THE

THE AUTHORS EPISTLE DEDICATORY TO HENRY III.

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 always 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-wealth, 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 Rashness and Envy, desire different and divers things whereof we have no knowledge. He which doth otherwise, perverts and defiles with hated confusion the order and beauty, on which this Universe consists. Wherefore when I considered with my self that I was a Member of this great Mundane Body, and that not 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 witness, and all good men know 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 prodigal 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, and the Desires of the Studious. Neither may we doubt but their Studies would at length wax cold, if they onely furnished with the Theorick and Precepts in Schools, and that with much labour, should see no manual operation, nor manifest way of performing the Art. For which cause I seeking the praise and profit of the* French *Nation, even with the 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 onely 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 Anatomical or Organical 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 encouragement to per-*

fect

fect and publiſh it, that it might be in common uſe: profeſſing they wiſhed nothing more, than that it might be turned into Latin, by which means it ſhould be known to foreign 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 ſcarce 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 knowledge. Therefore I doubted not to conſecrate this Book unto your Majeſty, both as a Pattern and Treaſury of my Labours, as well in reſpect of my duty, who am Yours by Nature and Education, as that I might manifeſt to all, your Highneſſes exceeding bounty towards me, in placing me (having heretofore enjoyed the Office of Principal 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 IX. *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 publick 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 ſplendour of his prefixed Name. I, encouraged by this hope, deſired that my requeſt ſhould paſs as by a certain continuation and ſucceſſion from a moſt Powerful, 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 ſucceſs of all your Enterpriſes abundantly added to* Neſtors *Years.*

Paris February 8.
Anno Dom. 1579.

Your Moſt Chriſtian Majeſties

Faithful Servant,

Ambroſe Parey.

THE

THE

PREFACE.

MOst Men derive the Original 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 Herbs and Plants, with infinite variety of the Flowers endued with various Scents, Tasts, Colours, and Forms, grew and sprung forth of the Bowels of the Earth, enriched with so many and great Virtues, 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 knowledge of these 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 Virtues of all things contained in the circuit of this Universe. So that if there be any who would ascribe the glory of this invennion to Man, he is condemned of ingratitude even by the judgment of Pliny. But this knowledge was not buried 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 onely 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, Honour the Physitian with the honour due unto him, for the Most High hath created him becaufe of neceffity: 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 Physician, 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 vital heat doth bring forth, temper, and cherish all things; or else some Heroes, who incited by an excellent and almost divine understanding, first taught and put in practice the Medicinal Vertues of Herbs; in which sense Ovid brings him in speaking thus:

Gen. 1.
Eccluf. 38. 1.

Herbs are of mine invention, and through all
The World, they me the first Physician call.

The original of Physick arising from those beginnings, shall always be celebrated as celestial, 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 exquisit 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 knowledge of Plants, and taught Æsculapius (as many report) their Faculties, is thought by Pliny and some others to have been the Inventer 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 enlarged, 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 lie hid within the body. Hippocrates the Coan the son of Heraclidas, born of the noble race of Asclepiades, Prince of the Physicians 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 onely for his knowledge 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

Plin. l. 7. c. 2.

profited

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 universal 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 or 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 passby a sick man in silence. Also* Strabo *writes that it was a custom in* Greece *that those which were sick should resort to* Æsculapius *his Temple in* Epidaurus, *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 fastned them to the Pillars of the Temple, not onely 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 his Art. For one Man was not onely instructed by another, but learned also much from brute Beasts; for they by the onely 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 respected 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 Physicians,* The Hands of the gods. *For as we by putting forth our hand, do help any man out of the Water and 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 special and divine gift deliver them out of the jaws of Death.* Homer *the Prince of Greek Poets affirms, That one Physician is far more worthy than many other Men. All Antiquity gave Physicians such honour, that they worshiped 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 daily experience) Physicians, as armed with* Mercuries *Rod, do bring back those languishing souls which are even entering the gates of Death? Hence it cometh to pass 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 excel in the knowledge 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 maist have power over other men, and favoured of Princes, Kings, and Emperours, maist appoint and prescribe to them those things which are profitable to preserve health, and cure their diseases? But if thou look for benefit by Sciences, 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 onely the men of the City, but also the women and children, and people of every Age, Sex 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 seeing their Country from the Plague, with triumphant pomp celebrated Plays to his honour, and bountifully set upon his head, as if he had been a King, a Crown of Gold weighing* 1000 *pieces of their golden* Coin, *and erected his Statue for a perpetual 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* 12500 *pieces of gold. In the time of our Grandfathers,* Petrus Aponensis *called* Conciliator, *was so famous through all* Italy *for his knowledge in Physick, that he could scarce 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 he went to cure* Heronius *the Bishop of* Rome, *he received* 400 *Crowns for every day he was absent. Our* French *Chronicles relate in what credit and estimation* James Cotterius *the Physician was with* Lewis XI. *King of* France; *for they report he gave him Monethly out of his Treasury* 10000 *Crowns. Physick in times past hath been in such*

In what esteem Physicians have formerly been.

ſuch Eſteem with many famous and noble Perſonages, that divers Kings and Princes delighted with the Study thereof, and deſirous to attain glory 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 *and* Bithynia, Achillea *of* Achilles, Centory *of* Chiron *the Centaure*, Artemiſia *of* Artemiſia *the Queen of* Caria. Attalus *King of* Pergamus, Solomon *of* Judæa, Evax *of* Arabia, *and* Juba *the King of* Mauritania, *were not onely inflamed with a deſire of the knowledge of Plants; but either they have written Books of it, or for the great commodity of Poſterity, invented by their skill, many choice Antidotes compounded of divers Simples; neither the deſire of Learning this moſt noble Science is yet altogether extinct; as may appear by that* Indian *Plant* Tobacco, *called by ſome the Noble Herb,* Catharines *Herb, and* Medices *Herb, but commonly the* Queens *Herb, becauſe* Catharine Medices *the Mother of our King, 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, 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 whileſt they adorned this part of Phyſick, ſuffer the other, which treats of the Diſſection of Mans Body, be buried in oblivion, and without their knowledge; as inſtructed with the Precepts and Learning of the Wiſeſt Men, how artificial and unimitable by mortal 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 Natural 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 habitation of their Souls immortal, and made to the Image of God: ſeeing they obſerved with certain judgement 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 ways ſo terrible by reaſon of cold, uncouthneſs, darkneſs, by rocks, by fire and ſword, with great labour, charge, and danger of life, onely that they might ſatisfie their minds thirſting after the knowledge of things; and to have left untouched a thing truly noble, admirable, and moſt worthy of knowledge, eaſie to be attained by any, and to be acquired without any danger of life or fortunes.*

Names given to Plants.

Seeing there be three parts of that Phyſick which at this time we profeſs; Chirurgery, *which by the uſe of the hand,* Diet *which with the convenient manner of feeding and ordering the body, and* Pharmacy *that by Medicins attempt to expel Diſeaſes, and preſerve Health; The prime Phyſicians do not without reaſon contend which 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 confeſs, that the manner of curing which which is performed by Diet, is much more facil and proſperous than that which is done by Medicins; as thoſe things which ſought with much labour 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 hurtful to the ſtomach. Yet if we will believe* Celſus, *neither of theſe parts merit the prehemineence, but both of them give place to* Chirurgery. *For ſeeing that Fortune is very powerful in Diſeaſes, and the ſame Meats and Medicins are often good and often vain, 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 moſt 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 Quartan Fevers, who having been long troubled by Phyſicians, are 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 antient; for* Podalirius *and* Machaon *following their General* Agamemnon *to the* Trojan *Wars, yielded 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 onely were accuſtomed*

Phyſick is divided into three parts.

to

The excellency of Chirurgery.

to heal Wounds by Inſtruments and Medicins. 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 knowledge of Diet *and* Pharmacy? *But both the other can perform their parts without Chirurgery, if we may believe* Galen. *But if we conſider the matter more nearly 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 Phyſician 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 counſel, that let him follow, maintain and onely uſe, as mindful how ſhort his life is, and how long the Art.*

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AN

AN INTRODUCTION or Compendious Way TO CHIRURGERY.

Book I.

CHAP. I.

What Chirurgery is.

CHIRURGERY 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 Physic 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 *Medicinal Definitions*; The quick motion of an intrepid hand joined with experience; or, An artificial action by the hand used in Physic, for some convenient intent. Yet none must think to attain to any perfection in this Art, without the help of the other two parts of Physic; I say, of Diet and Pharmacy, and the diverse applications of proper Medicines, respecting the condition of the Causes, Diseases, Symptoms, and the like Circumstances, which comprehended under the names of things natural, not natural and beside 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 knowledge 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 Empirics. Wherefore seeing we have set down Chirurgery to be, A diligent Operation of the hands, strengthned 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 Chirurgical Operations.

FIve 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 joined together; to join those that 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 lively express any thing, as that which is subjected to the faithful eyes and hands.

The nature of a Chirurgeon.

Experience more necessary for a Chirurgeon than Art.

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 mail, 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 eye-lids which trouble the eye by their turning in towards it: who cuts away the web, possessing all the **Adnata*, and the part of the **Cornea*: who letteth forth suppurated matter: who taketh out stones in what part soever of the body they grow; who pulls out a rotten or otherwise hurtful tooth; or cuts a nail that runs into the flesh; who cuts away part of the *Uvula*, or hairs that grow on the eye-lids: who taketh off a Cataract; who cuts the navil or foreskin of a child newly born; or the skinny caruncles of womens privities.

Examples of taking away that which is superfluous.

*Two tunicles of the eyes.

Examples of placing those things which are out of their natural site, are manifest in restoring dislocated bones; in re-placing of the guts and gall fallen into the cods, or out of the navil 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.

Examples of re-placing.

But we may take examples of disjoining 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 troubling the neck of the womb; by diffe-

Example of separating things joined together.

ction

ction 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 various 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 eye-lids. Refer to this place all the works done by Cauſtics, 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 bolſtring, 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 eye, a noſe, one or more teeth; who fills 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, workman-like: who fits a doublet bombaſted, or made with iron plates to make the body ſtreight; who fills a ſhoo too big with cork, or faſtens a ſtockin 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, or 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 perpetual miſery. Who therefore can juſtly abhor a Chirurgeon for this, or accuſe him of cruelty? or deſire they may be ſerved as in antient 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 *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 perpetual 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 mercileſs; 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 needful; 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.

Ie Præf. l. 7. The properties of a good Chirurgeon.

CHAP. III.
Of things Natural.

THat the Chirurgeon may rightly and according to Art perform the foreſaid works, he muſt ſet before his eyes certain Indications of working: Otherwiſe, he is like to become an Empiric, 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) natural, not-natural and beſide-nature, and their adjuncts, as it is ſingularly delivered of the Antients, being men of an excellent underſtanding. Wherefore we will proſecute according to that order, all the ſpeculations of this Art of ours. Firſt therefore, things Natural are ſo termed, becauſe they conſtitute and contein 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 Nat. humana:* wherefore the conſideration thereof belongs to that part of Phyſic, which is named *Phyſiologia*; as the examination of things not natural to *Dietetice* or Diet, becauſe by the uſe of ſuch things it endevors to retein and keep health: but *Therapeutice*, or the part which cures the Diſeaſes, and all the affects beſide nature, challenges the contemplation of thoſe things which are not agreeable to nature. But the things which are called Natural, may be reduced to ſeven heads: beſide which there comes into their fellowſhip, thoſe which we term, Annexed.

From whence we muſt draw Indications.

What things are called natural.

To what part of Phyſic things not natural pertain.

To what, things beſides nature.

The ſeven principal heads of things Natural; are	*Elements*	To theſe are annexed, as ſomewhat near;	*Age*
	Temperaments		*Sex*
	Humors		*Colour*
	Parts or Members		*Compoſure*
	Faculties		*Time or ſeaſon*
	Actions		*Region*
	Spirits		*Vocation of life*

CHAP. IV.
Of Elements.

AN Element (by the definition which is commonly received among Phyſicians) 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 external ſenſe to handle them in their pure and abſolute nature. Which was the cauſe that *Hippocrates* expreſſed them not by the names

What an Element is.

Elements are underſtood by reaſon, not by ſenſe.

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 essential 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 principal, 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 principal, and not remitted by the commixture of any contrary quality, for otherwise they were not simple. Therefore thou maist say, what hinders that the principal 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 endued with qualities.

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	is	Hot and dry	Names of the qualities.
	Air		Moist and hot	
	Water		Cold and moist	
	Earth		Cold and dry.	

These four Elements in the composition of natural 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 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 smoak, 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 neighbourhood; 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 powerful; 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 principal 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 heavy, 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 site, we account light; for the water which lies next to the Air, we judg heavy; 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 heavy 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 corporal, 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, membrances, ligaments, veins, arteries, and many others manifest to the eyes, which we will describe at large in our Treatise of Anatomy.

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

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.

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 inferiour 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 juyce 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 perpetual continuance of their kind. But the

What a Temperament is.

* *Anima.*

What the life performs in Plants.

* *Anima*, What in beasts. Mans soul comes from above.

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 hurtful, 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.

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 somwhat 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 somwhat hinders them, so that they cannot so well and perfectly perform their duties. But the vicious Temperament doth three manner of ways corrupt the functions, either by weakning, depraving, or abolishing them. For so, *Stupor*, or astonishment, diminisheth and slowеth 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 equal 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 drines, 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 extreams 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 equal and unequal 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 sustein weight. But a Ligament, seeing it was made for other uses, hath less of that earthly drines 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 equal 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 natural 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 kinds of untemperate tempers.

Four simples { *Hot*, *Cold* } temperate in { *Drines* and *Moisture.* } Four Compounds { *Hot* and *Moist*, *Hot* and *Dry*, *Cold* and *Moist*, *Cold* and *Dry*.
Four simples { *Moist*, *Dry* } temperate in { *Heat* and *Cold.* }

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

3

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. }

Lib. 2. *de Temper. & in Arte medica.*

Again, such Temperaments are either healthful, which suffice perfectly to perform their actions; or unhealthful, which manifestly hurt them, the signs 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 kind 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 good in this place, briefly to handle the Temperaments of the parts of the Body, Ages, Seasons of the year, Humors, and Medicins. 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, compositure, and substance, as

What the temperaments of mans body are.

A

A Bone is the moſt dry and cold.
A Griſle leſs than it.
A Ligament leſs than a Griſle.
A Tendon is ſo much drier 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 if, 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 ſpinal 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.*

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 drineſs; 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 acid and biting, which in Childhood ſeemeth mild, becauſe the progreſs of the life to drineſs, hath much waſted the native humidity. The temperaments of ages. What an age is.

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 extream 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 board 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 radical 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 natural heat, turned by feavers into a fiery heat. But if any to prove Old men moiſt, will object, That they cough oft, 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 always to be meaſured by the ſpaces and diſtances of years; for there are many which by their own miſdemeanour ſeem elder at forty, than others do at fifty. Old-age divided into two parts. * Three degrees of the ſecond part of Old-age. Old men have their ſolid parts dry.

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 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, until 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. A comparion of the four ages to the four 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 trial, 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 Winter, and colder than Summer; but becauſe it hath that quality of its own proper nature. Wherefore it is ſaid of *Hippocrates*, The Spring is moſt wholeſ- The temperaments of the ſeaſons of the year. How the ſpring is temperate. *Aphor. 9. ſect. 3.*

wholesom, 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 humour 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 them long and deadly, especially if they incline towards Winter; because all daily and sudain changes to heat and cold are dangerous. The Winter possesses the remnant of the year, and is cold and moist, it increases natural heat, stirs up the appetite, and augments Phlegm. It increases 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 Phlegm, for that men are more greedy, the Appetite being increased by the strengthened heat: from whence proceeds much crudity, and a large store of diseases, especially Chronic or Long, which spread and increase 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, Autumnal 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 Physician 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 Countrys 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 Natural Philosophers, that we may deliver our judgment of the temperaments of *Humours*. 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 watrish 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 general of Phlegm and Melancholy, is not always true in every kind of the said Humours. 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 applied, 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 Driness. But we will defer the larger explication of these things to that place, where we have peculiarly 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 Physical speculation is no less than that of Temperaments.

Aphor. 20. *sect.* 3.

Autumn unequal.

How Winter increases 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.

CHAP. VI.

Of Humors.

TO know the nature of *Humors*, is a thing not only necessary for Physicians, but also for Chirurgeons, because there is no disease with matter which arise 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 original 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; *Phlebotomy*, 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 knowledg of the Humors is necessary.

Lib. *De natura Humana.*

The helps of Health.

What an Humor is.

An *Humor* is called (by Physicians) what thing soever is liquid and flowing in the body of living Creatures endued with Blood: and that is either natural, or against nature. The natural 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 Excre-

The manifold divison of Humors.

men-

mentitious: 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 general 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 material 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 meat yields 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 Meseraic-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 natural 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 too 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 natural 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 Naturâ humanâ*, Melancholy is acid or sowr, Choler bitter, Blood sweet, Phlegm unsavoury. 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 Phlegmatic; a *Scirrhus*, by Melancholic; an *Erysipelas*, by Choleric; and a *Phlegmone*, by pure and laudable blood. *Galen* teaches by a familiar example of new wine presently taken from the Press, that these four substances are contained in that one mass and mixture of the blood. In which every one observes four 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 heavines ever sinketh downward, as it were, the mud of the blood; the crude and watery portion, Phlegm: for as that crude humour, except it be rebellious in quantity, or stubborn by its quality, there is hope it may be changed into Wine, by the natural 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 two 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 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.

The material and efficient causes of blood.

What the *Chylus* is.

* *Vena porta.*

Where the Blood is perfected.

The receptacles of Cholet and Melancholy.

Four unlike Humors in the Blood.

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 airy, hot and moist, or rather temperate.*	*Of indifferent consistence, neither too thick nor too thin.*	*Of Colour, red rose 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 slipperiness 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, gross 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

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 or 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 perſuaded 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 blood, different in its four eſſential parts, is perfected and made at the ſame time, and by the ſame equal temper of the ſame part, action, and blood-making faculty; therefore from whence 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 joyned 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.

Lib. 1. de temp.

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

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 kind in all of us; but rather to the material 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 thereof 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 Original of Choler ſhould be from a more acid, 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, and in thoſe which incline to old age, by reaſon of the ſimilitude which Phlegm hath with that ſeaſon and age. It makes a man drowſie, dull, fat, ſwollen up, and haſtneth gray hairs. Choler is as it were, a certain heat and fury of humours, which generated in the Liver, together with the blood, is carryed 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 arterial 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 acid and bitter meats give matter to it: but great labors 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 meat. The Melancholic 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 drineſs; it is made of meats of groſs juyce, and by the perturbations of the mind, turned to fear and ſadneſs. It is augmented in Autumn, and in the firſt and crude Old-age; it makes men ſad, harſh, conſtant, froward, envious and fearful. 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 appear in the French-Pox. From the elaborate and abſolute maſs of the blood, (as we ſaid before) two kind of Humors, as excrements of the ſecond concoction, are commonly and naturally ſeparated, the one more groſs, 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 attriction ſtrengthen the actions thereof. But yellow Choler drawn into the bladder of the gall, remains there ſo long, till being troubleſome; either in quantity

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

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

The effect of Phlegm.

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.

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 kills the worms that are bred there. The ſame Humor is accuſtomed to die the urine of a yellow colour. There is another ſerous Humor, which 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 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 thereof, carried 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 Natural 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.

A ſerous or wheyiſh humor.

Secondary 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, acid 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 natural is bred, either*
  - In the Veins, and is either
    - Acid 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, and 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 accidental 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.
- *Choler not natural 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, and laſtly into a blue, or colour like that which is died 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 bluiſh, 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.

* *Albuminea.*

* *Vitellina.*

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

The

The signs of a Sanguine Perſon.

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 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 curious, 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 great and ſtrong Pulſe, and much urine in quantity, but mild of quality, and of an indifferent colour and ſubſtance.

Such as the humor is, ſuch is the colour.
The manners and diſeaſes of Sanguine perſons.

The ſigns of a Choleric Perſon.

CHoleric men are of a pale or yellowiſh color, 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 acid exhalation which breaths 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, liberal even to prodigality, and ſomewhat 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 Choleric puſtles, the Lask, Bloody flux, and bitterneſs of the mouth.

Choleric are not commonly fat.
The manners and diſeaſes of Choleric perſons.

The ſigns of a Phlegmatic Perſon.

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 Phlegmatic diſeaſes, as Oedematous tumours, the Dropſie, Quotidian feavers, falling away of the hairs, and Catarrhs falling down upon the Lungs, and the *Aſpera Arteria*, or Weaſon: they are of a ſlow capacity, dull, ſlothful, drowſie; they do dream of rains, ſnows, floods, ſwiming, and ſuch like, that they often imagine 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.

The manners and diſeaſes of Phlegmatic perſons.

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

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

From whence noiſe or rumbling in the belly proceeds.

Signs of a Melancholic Perſon.

THe face of Melancholy perſons is ſwart, their countenance cloudy and often cruel, their aſpect is ſad and froward; frequent Scirrhus or hard ſwellings, tumors of the Spleen, Hemorrhoids, *Varices* (or ſwollen Veins) Quartan feavers, whether continual or intermitting; Quintan, Sextan, and Septiman feavers: and to conclude, all ſuch wandering feavers or agues ſet upon them. But when it happens, the Melancholy humor is ſharpened, 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 St. *Maris* 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 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 ſlowneſs 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 edge 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, ſepulchres, dead corpſes, and many other ſuch things full of horror, by reaſon of a black vapor, divertly 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 find them froward, fraudulent, parſimonious, and covetous even to baſeneſs, ſlow ſpeakers, fearful, ſad, complainers, careful, 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.

Diſeaſes familiar to Melancholy perſons.

From, or by what their Veins are ſwollen.

Their dreams.
* *Hydrophobi.*
Their manners.

But

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 Choleric, Melancholic, or Phlegmatic; 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 Choleric, if he eat hot and dry meats, (as all like things are cheriſht and preſerved by the uſe of their like, and contraries are deſtroy'd by their contraries) and weary his body by violent exerciſes and continual labors; and if there be a ſuppreſſion of Choleric 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, careful 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 Hemorrhoids, courſes and ſtools.

From whence the change of the native temper.

How one may become Choleric.

How Melancholic.

But he acquires a Phlegmatic 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 Phlegmatic humor accuſtomably 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 Phlegmatic, Melancholic, 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 practical demonſtration of examples, the uſe and certainty of the aforeſaid Rules of Temperaments.

How Phlegmatic.

CHAP. VII.

Of the Practice of the aforeſaid Rules of Temperaments.

THat we may draw the Theoric of the Temperaments into practice, it hath ſeemed good for avoiding 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 judge 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, dusky-colored, and pale, with black eyes and great lips, curled hair, and a ſmall and ſhrill voice. Thoſe which inhabit the Northern parts, as the *Scythians*, *Moſcovites*, *Polonians*, and *Germans* have their faces of color white, mixt with a convenient quantity of blood, their skin ſoft and delicate, their hair long, hanging 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 grey, 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 color of Goats-eye, and often hollow-eyed, having a clear, ſhrill and pleaſing voice.

Four bounds or regions of the world.

The forces of temperatures in particular.

The temperature of the Southern people.

Of the Northern.

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 *Africe* 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 Duel only determin all cauſes and controverſies ariſing amongſt the Inhabitants, as we may gather by the antient Laws and Cuſtoms of the *Lombards*, *Engliſh*, *Burgundians*, *Danes* and *Germans*; and we may ſee in *Saxo* the Grammarian, that ſuch a Law was once made by *Frotho* King of *Denmark*. The which Cuſtom at this day is every where in force amongſt the *Moſcovites*. But the Southern people have always 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*, *Egyptians*, *Perſians* or *Jews*: But moved by the goodneſs of their wit, they erected Kingdoms and Empires by the only help of Learning and hidden Sciences. For ſeeing by nature they are Melancholic, by reaſon of the drineſs of their temperature, they willingly addict themſelves to ſolitarineſs and contemplation, being endued with a ſingular ſharpneſs of wit. Wherefore the *Ethiopians*, *Egyptians*, *Africans*, *Jews*, *Phœnicians*, *Perſians*, *Aſſyrians*, and *Indians*, have invented many curious Sciences, revealed the myſteries and ſecrets of Nature, digeſted the Mathematics 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, and have only a Wagon 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 abundance 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 earthly maſs of their bodies, are eaſily drawn

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

The Southern people learn'd and religious.

The Northern famous Warriers and Artificers.

drawn from heaven and the contemplation of celestial things, to these inferior things, as to find out Mines by digging, to buy and cast metals, 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 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 Mechanic 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 subtle counsels, crafty sleights and devices; yet could not escape, but at length their arts being eluded, and they spoil'd of all their fortunes, were brought in subjection to the *Romans*.

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

The *Gothes*, *Hunns* and other Northern People have spoiled and over-run the *Roman* Empire by many incursions and inroads, but destitute of counsel and providence, they could not keep those things which they had gotten by Arms and Valour. Therefore the Opinion of all Historians is agreeing in this, that good Laws, the form of governing a Common-wealth, all politic 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 is 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 Wars, and those between both for Empire and Rule. The *Italian* is naturally wise, the *Spaniard* grave and constant, the *French* quick and diligent; for you would say he runs when he goes, being compared to the slow pace of the *Spaniard*, which is the cause that *Spaniards* are delighted with *French* Servants for their quick agility in dispatching business.

The abundance of Counsellors and Lawyers from *France* and *Italy*.

The Eastern people are specially endued with a good, firm and well-temper'd wit, not keeping their counsels secret and hid. For 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 always the more strong and vigorous. But the Western people are more tender and effeminate, and more close in their carriage and mind, 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 always inclines to the West, whereby it happens that it is reputed as nocturnal, sinister and opposite to the East; and the West is less temperate and wholsom. Therefore of the Winds none is more wholsom than the East-wind, which blows from the West with a most fresh and healthful gale; yet it seldom blows, but only at Sun-set.

The manners of the Eastern people.

The Eastwind healthful.

The Northern people great eaters and drinkers.

The Northern people are good eaters, but much better drinkers, witty when they are a little moistned 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 shame-fac'dness and chastity, far different from the Inhabitants of the South, who are wonderful sparing, sober, secret and subtle, and much addicted to all sorts of wicked Lust. *Aristotle* in his *Problems* saith, that those Nations are barbarous and cruel, both which are burnt with immoderate heat, and which are oppress 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 cruel; but these have this of a certain natural stoutness and soldier-like boldness, and rather of anger than a wilful 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 *Transylvanians* against their seditious Captain *George*, whom they gave to be torn in pieces alive and devoured by his Souldiers, (being kept fasting for three days 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 cruel 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.

Who are to be counted barbarous.

The Northern and Southern have each their cruelties.

Val. Max. l. 9. c. 2.

The diseases of the Southern people.

And as the Inhabitants of the South are free from divers Plethoric Diseases, which are caused by abundance 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 term it *S. Vitus his evil*) which admits of no remedy but Music: so they are often molested with the Frensie, invading with madness and fury; by the heat whereof they are often so ravisht and carried beside themselves, that they foretel things to come; they are terrified with horrible dreams, and in their fits they speak in strange and forein tongues; but they are so subject to the scurf and all kind of scabs and to the Leprosie as their homebred disease, that no houses are so frequently met withal by such as travel through either of the *Mauritania's*, as Hospitals provided for the Lodging of Lepers.

Mountainers.

Those who inhabit rough and mountainous places, are more brutish, tough and able to endure labour. but such as dwell in Plains, especially if they be mooriish or fenniih, are of a tender body, and sweat much with a little labour; the truth of which is confirmed by the *Hollanders* and *Frislanders*. 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*. Those who dwell in poor and barren places are commonly more witty and diligent

and

and moſt patient of labors; the truth of which the famous wits of the *Athenians*, *Ligurians* and *Romans*, and the plain country of the *Baotians* 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 principal Faculties governing mans body, as long as it enjoys its integrity; the Animal, Vital and Natural. The Animal is ſeated in the proper temperament of the Brain, from whence it is diſtributed by the Nerves into all parts of the body which have ſenſe and motion. This is of three kinds; for one is Moving, another Senſitive, the third Principal. The Senſitive conſiſts in five external Senſes; Sight, Hearing, Taſte, Smell and Touch. The Moving principally remains in the Muſcles and Nerves, as the fit inſtruments of voluntary motion. The Principal 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. What a Faculty is. 3 Faculties.

The Vital abides in the heart, from whence heat and life is diſtributed by the Arteries to the whole body; this is principally hindred in the diſeaſes of the Breaſt; as the Principal is, when any diſeaſe aſſails the Brain; the prime Action of the vital 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 Vital Spirit is cheriſhed by the benefit of the Air which is drawn in; by the contraction thereof, the vapors 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 laſt is the Natural Faculty which hath choſen its principal ſeat in the Liver, it ſpreads or carries the nouriſhment over the whole body; but it is diſtinguiſht into three other faculties; The Generative, which ſerves for the generation and forming of the Iſſue in the womb; the Growing or Increaſing faculty, which flouriſheth from the time the Iſſue is formed, until the perfect growth of the ſolid parts into their full dimenſions of length, height and breadth. The nouriſhing faculty, which as ſervant to both the other, repairs and repays the continual 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 womb until the end of life. It is a matter of great conſequence in Phyſic, to know the four other faculties, which as Servants attend upon the nouriſhing faculty; which are the Attractive, Retentive, Digeſtive and Expulſive faculty. The Attractive draws that Juice 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 ſcarce taſted, into the gnawing and empty ſtomach. The Retentive faculty is that which retains the nouriſhment once attracted, until it be fully laboured and perfectly concocted; and by that means it yields no ſmall aſſiſtance to the Digeſtive faculty. For the natural heat cannot perform the office of concoction, unleſs the meat be embraced by the part, and make ſome ſtay therein. For otherwiſe the meat, carried into the ſtomach, never acquires the form of *Chylus*, unleſs it ſtay detained in the wrinkles thereof as in a rough paſſage, until the time of *Chyliſication*. The Digeſtive faculty 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 yield no ſmall help to nouriſhment; it is called the Expulſive, appointed to expel 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 twofold; 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 four, as well common as proper, are abiding and reſiding as in thoſe parts we now mentioned; ſome, with the four proper have only two common, as the Gall, Spleen, Kidneys and Bladder. Others are content only with the proper, as the ſimilar and muſculous parts, who if they want any of theſe four faculties, their health is decayed either by want of nouriſhment, an ulcer, or otherwiſe. The like unnatural affects happen by the deficiency of juſt and 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 joined to it, then agglutinated, and laſtly, as we have ſaid, aſſimilated. Now we muſt ſpeak of the Actions which ariſe from the faculties. The natural Faculty is threefold. 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. 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 natural Actions; but the parts nourished, and a hollow 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. But Actions are two-fold: for they are either Natural, or Voluntary. They are termed Natural, because they are performed not by our will, but by their own accord, and against our will: As are, that continual 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 Action flow either from the Liver and Veins, or from the Heart and Arteries. Wherefore we may comprehend them under the names of Natural and Vital Actions. For we must attribute his Action to each faculty, left we seem to constitute an idle faculty and no way profitable for use. The unvoluntary vital 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 expel or drive forth. The unvoluntary vital actions be,

An Action and an Act are different.

Natural Actions.

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

What Generation is.

Generation is nothing else than a certain producing or acquiring of matter, and an introducing of a substantial 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 four 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 general, the sensative, moving and principal 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 principal Organ or Instrument is the Animal 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 carries the Object to the Instrument. The Object is a certain external 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 Organical body of this Action. The Object is a visible quality brought to the Eye. But such an Object is two-fold; for either it is absolutely visible of itself, 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 only, 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, Glass, and all sorts of Crystal.

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 *Galen*'s 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,

How the Taste.

is the Air; but to Fishes the Water itself. The Action of Taste, is performed by the Tongue, being

being tempered well and according to nature, and furnished with a Nerve spread 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 external or internal: The external is that spattle which doth, as it were, anoint and supple the tongue; the internal is the spongy flesh of the tongue it self, which affected with the quality of the Object, doth presently to possess the nerve that is planted in it, that the kind and quality thereof, by the force of the spirit, may be carried into the common sense. 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 lieth 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, Ductuosity, Grossness, Thinness. The *Medium* by whose procurement the instrument is affected, is either the skin or the flesh interwoven with many Nerves.

* *Sapor.*

How touching.

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 extension: 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. 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.

Of motion.

How Respiration may be 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, we must hold, that Respiration is undergone and performed by the Animal faculty, but chiefly instituted for the Vital.

The principal Action and prime amongst the Voluntary, is absolutely divided into three, Imagination, Reasoning and Memory.

The third principal Action.

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 judicial estimation of conceived or apprehended forms or figures, by a mutual 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 Natural, or Animal 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 subtil and airy 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, do presently cease from action, and as dead, do rest from their accustomed labours. From hence it is, that making a variety of Spirits according to the number of the faculties, they have divided them into three; as one Animal, another Vital, another Natural.

Spirits threefold.

The Animal 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 Animal, not because it is the * Life, but the chief and prime instrument thereof: Wherefore it hath a more subtil and airy 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 eyes, 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 Animal Spirit.

Why so called * *Anima.*

This Animal spirit is made and laboured in the windings and foldings of the Veins and Arteries of the brain, of an exquisite subtil portion of the Vital brought thither by the *Carotidæ Arteriæ*, or sleepy Arteries; and sometimes also of the pure air, or sweet vapour drawn 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 Humour which obstructs or stops it 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 Vital 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

The Vital Spirit.

short time, unless it should be refreshed with heat flowing thither together with the spirit. And because it is the most subtil next to the Animal, Nature (left 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.

What the matter of it is.

It is furnished with matter from the subtil exhalation of the blood, and that air which we draw in breathing. Wherefore, as 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 sudden death of those which are infected with the Plague. This Spirit is often hindred from entring into some part, by reason of obstruction, fullness, 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.

There is some doubt of the Natural Spirit.

The Natural spirit (if such there be any) hath its station in the Liver and Veins. It is more gross and dull than the other, and inferiour 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 several part, and to carry blood and heat to them.

Fixed Spirits.

Besides those already mentioned, there are other Spirits fixed and implanted in the similar and prime parts of the body, which also are natural, and Natives of the same place in which they are seated and placed. And because they are also of an airy and fiery nature, they are so joyned, 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 principal Instruments of the Actions which are performed in each several part: And these fixed Spirits have their nourishment and maintenance from the radical and first-bred moisture, which is of an airy 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 radical 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 natural heat, followeth the decay of this sweet and substance-making moisture, and consequently death, which happens by the dissipating and resolving of natural heat.

The radical moisture.

Natural death.

But since then these kinds of Spirits, with the natural 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 increase, it hath also its proper Spirit, and also its own proper fixed and implanted heat, which here hath its abode, as well as its Original. 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.

The use and necessity of the Spirits.

These being by any chance dissipated or wasted, we languish; neither is health to be hoped for, the flower of life withering and decaying by little and little. Which thing ought to make us more diligent, to defend them against the continual 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 juyce, easie to be concocted and distributed; good Wines, and fragrant smells.

What the remedy for the dissipation of the Spirits.

What the remedy for oppression of the Spirit 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 those things which are called Natural, 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 natural, 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 *Instrumental* parts.
- *Time:* whose force we have also considered.
- *Region.*
- Order of *Diet*, and condition of *Life.*

CHAP. XI.

Of the Adjuncts of things Natural.

What sex is.

The nature of women.

Of Eunuchs.

SEX is no other thing than the distinction of Male and Females 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 spermatical parts are more cold, soft, and moist; and all their natural actions less vigorous and more depraved.

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 voyce do very much assimilate women. Notwithstanding you must consider, that there be some manly Women, which

which their manly voice, and chin covered with a little hairiness, do argue; and on the contrary, these are some womanizing, or womanish men, which therefore we term dainty and effeminate.

The Hermaphrodite is of a double nature, and in the middle of both Sexes, seems to participate of both Male and Female. *Of Hermaphrodites.*

The Colour which is predominant in the habit and superficies of the body, and lies 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 is carried abroad by the plenty of Spirits. But if the skin be died with a yellow colour, it argues Choler is predominant; if with a whitish and pallid hew, 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 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 unnatural Tumors: For, as the colour, so the dominion of the Humor causing or accompanying the Swelling commonly is. *Colour the bewrayer of the Temperament.*

The conformity and integrity of the Organical parts is considered by their figure, greatness, number, situation, and mutual connexion. We consider the figure, when we say, almost all the external 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 external 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 joyned together. *The perfection of the organical parts, consists in four things.*

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-natural.

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 though those which labour 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 Shoo-makers; 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 natural temper of the body. The ingenious Chirurgion may frame more of himself that may more particularly conduce to the examination of these things. Therefore the things natural, 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-natural. *The commodities of an indifferent Diet.*

CHAP. XII.

Of things Not-natural.

THe things which we must now treat of, have by the later Physitians been termed Not-natural; 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 Doubtful, and Neuters; for that rightly and fitly used, they keep the body healthful, 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 preposterous 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 of themselves are, as it were, doubtful, 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-natural; as, things Taken, Applied, 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 applied, 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 drieness. Expelled, are what *Why they are called things Not-natural.* *Galen. 1. ad Glauconem.* *Lib. de Sanitat. tuenda.*

things foever 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 ſix:

Which are
- *Air.*
- *Meat* and *Drink.*
- *Labour* and *Reſt.*
- *Sleep* and *Watching.*
- *Repletion* and *Inanition*; or things to be expell'd, or retained and kept.
- *Perturbations* of the Mind.

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 nouriſh the Diſeaſe, that if it may ſeem to burthen 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 hurtful 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 hurtful.

Therefore to conclude, That air is to be eſteemed healthful, which is clear, ſubtil and pure, and free and open on every ſide, and which is far remote from all Carion-like ſmells 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 vernal temper, is good againſt all diſeaſes, That Air which is contrary to this, is altogether unhealthful; 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.

Phyſicians 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 unequal; 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 Autumnal 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 ſudden change. Wherefore we will briefly touch their natures: That which blows from the Eaſt, is the Eaſt-wind, and is of a hot and dry nature, and therefore healthful, 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 healthful, 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 thoſe Regions from which they firſt proceed. For, otherwiſe they affect the Air quite contrary, according to the diſpoſitions of the places over which they came; as, Snowy places, Sea, 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 Weſt wind of it ſelf unwholſome.

Hence it is we have noted the Weſtern-wind unwholſome, 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 ſeldoms 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 original. 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 Aere & 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 hurtful, or helping in diſeaſes, came that famous obſervation of *Guido* of *Cauliac*, That wounds of the head are more difficult to cure at *Paris*, than at *Avignon*, and

and the plain contrary of wounds of the legs; for the air of *Paris*, compared to that of *Avignon*, is cold and moiſt, wherefore hurtful 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 humors, by whoſe defluxion the cure is hindred. But it is manifeſt, that hot and dry places make a greater diſſipation of the natural heat, from whence the weakneſs of the powers; by which ſame reaſon the Inhabitants of ſuch places do not ſo well endure bloodletting; but more eaſily ſuffer purgation, though vehement, by reaſon of the contumacy 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 ſudden and unaccuſtomed alteration, which any man may prove, who makes a ſudden 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 legs.

By what means the air changes our bodies.

CHAP. XIV.

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 illneſs 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 juyce which they beget in us. For evil juyce cauſeth many diſeaſes. As on the contrary, good juyce 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 eggs, 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 examines thoſe which are of evil juyce 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 yield 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 a large relation made in *Sect.* 1. of the Aphoriſms of *Hippocrates*; where he teacheth, the ſick muſt feed more largely in the beginning 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 kind, 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 plentiful 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 Glutony, 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 thoſe who are 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 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 nouriſhments 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 endeavour to abate its fury by the uſe of contraries.

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.

Old-age a diſeaſe.

Aphor. 16. *Sect.* 1.

But

The force of Cuſtom.

But if Cuſtom (as they ſay) be another nature, the Phyſician muſt have a great care of it, both in ſound and ſick. For this ſometimes by little and little, and inſenſibly, changes our natural temperament, and inſtead thereof gives us a borrowed temper. Wherefore if any would preſently or ſuddenly change a Cuſtom, which is ſometimes ill, into a better, truly he will bring more harm than good; becauſe all ſudden 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 uſual government. For that meat and drink which is ſomewhat 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 Countrey-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, and as it were, burning heat, but much more to Cuſtom; which by a certain kind of familiarity, cauſeth that means 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 acid and nidorulent belchings, loathing, nauſeouſneſs, vomit, heavineſs, pain of the head, and trouble of the whole body.

Aphor. 51. *ſect.* 2.

Aphor. 38. *ſect.* 2.

Accuſtomed meats are more grateful, 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 Phyſician to ſubſcribe to, and pleaſe, the palat of his Patient.

The order of eating our meats.

But ſeeing that Order is moſt beautiful 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 grateful 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 joyned 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 evening 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.

Neither 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 healthful, 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 labours ought to go before; for it is fit, according to the Precept of *Hippocrates*, that labour 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 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 yields 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 to be had of the ſtrength of the Patient, and greatneſs of the diſeaſe.

The profit of labour before meat.

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

Variety of meats.

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 continual and hateful feeding upon the ſame meat, may at 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 Phyſicians, who think the digeſtion is hindred by the much variety of meats.

Why variety of meats is good.

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.

Moreover, ſeeing our body is compoſed of a ſolid, moiſt, and airy ſubſtance; and it may happen, that by ſo many labours, 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, yield 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

Indications of feeding, taken from the age.

ſuffice

ſuffice to nouriſh, but increaſe the body. Wherefore they worſt endure faſting, and of them eſpecially thoſe who are the moſt lively and ſpiritful. 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.

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 fearveriſh 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.

HEre Phyſicians 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 burthen, 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 the Phciyſians. 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. That Friction is called hard, which is made by the rough, or ſtrong preſſure of the hands, ſpunges, or a coarſe 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 unwrinckled; 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, ſwells 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. What Motion ſignifies. Three kinds of Frictions. Hard. Gentle. Indifferent.

The benefit of Exerciſe is great, for it increaſes natural 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 office 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 mutual attrition of the one with the other; whereby it comes to paſs they are not ſo quickly wearied with labour. Hence we ſee, that Country-people are not to be tired with labour. The uſe of exerciſes.

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. What the fitteſt time for exerciſe.

Wherefore the beſt time for exerciſe will be before meat (that the appetite may be increaſed by augmenting the natural 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 humours 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 exercife longer, ſtiffneſs and wearineſs aſſails his joynts, 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 which we require, is in the midſt of exerciſe; ſo that the exercife muſt be neither too ſlow and idle, neither too ſtrong nor too weak, neither too haſty nor remiſs, but which may move all 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, ſtronger, and long 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 urin. 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 acrid 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 faſtned 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. The quality of exerciſe. For whom ſtrong exerciſes are convenient.

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 members; that ſo the ſweat breaking *Antipgoge.*

ing 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 from Idleness; for gross and vicious juyces heaped up in the body, commonly produce crudities, obstructions, stones both in the reins and bladder, the Gout, Apoplexy, 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 Animal 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 labour, 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. Neither doth sleep only give ease to the wearied members, but also lessens our cares, and makes us to forget our labours.

Fit time for sleep, and the nature of the night.

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

Sleep on the day-time.

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 in the day time may be hurtful. 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 acid or sour belchings, and the brain troubled with gross vapors and excrementitious

There ought to be a moderation of our nights sleep.

humidities. From whence proceed pain and heavinesse 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 vapour, into the veins, principal 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 con-

How to be known.

coction, 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, acid belching, pain of the head, and heavinesse of the whole body, shew that the concoction is unperfect.

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

In sleeping we must have special care of our lying down; for first we must lie 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 powerful 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 a 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 harm of lying on our backs.

the vapours which arise from the elixation of the *Chylus* 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,

Upon our bellies.

and all the diseases which have their original from the defluxion into the spinal marrow, and to the Nerves taking beginning from thence. To lie upon the belly is not unprofitable for such as have used to lie so, if they be not troubled with defluxions into the eyes; 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 about the Ventricle, but the encompassing warmness of the soft feathers of the bed aids and assists it.

The consideration of dreams.

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 marvellously 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 gulphs in the earth, thick and obscure darkness, smocks, caves, and all black and dismal things. But those whose bodies abound in blood, dream of marriages, dances, embraces of women, feasts, jests, laughter, of orchards and gardens; and to conclude, of all things pleasant and splendent.

Also

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

Cum labor a ſomno eſt, lethalem colligе 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 hurtful; 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.

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 two 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. The kinds of Repletions, or rather of Exceſſes. * *Repletio* { *ad veſa* / *ad vires*

We judge of Satiety to the veſſels, by the diſtention and ſwelling of the veins, and entrals, 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* to be 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.*

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. What *Cacochymia* is.

Now Inanition or Evacuation, is no other thing than the expulſion or effuſion of humors which are troubleſome, either in quantity or quality. Of Evacuation, ſome are univerſal, which expel 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, eyes, 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 Phyſician in imitation of nature. The kinds of Evacuation.

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

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. The commodities of moderate ſcratching.

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 healthful, eſpecially in ſharp diſeaſes, if they proceed from the whole body, and happen on the critical days. By Vomit, which often violently draws theſe humors from the whole body, even from the utmoſt joynts, which purging Medicines 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, disburtheneth it 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 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 Quick-ſilver 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, purgations, ſweats, inſenſible

sible 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 Medicines. We do the same by Exercise, Diet, Hot-houses, long sleep, walking, and shedding of tears. By sucking, as with Cupping-glasses, and Horse-leeches in wounds made by venemous bitings.

We must observe three things in every Evacuation.

In all such kinds of Evacuations, we must consider three things, the quantity, quality and manner of Evacuation. As for an example, When an *Empiema* 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 one time, but by little and little, and at several times; otherwise, not a little quantity of the spirits and heat doth flow together with the unprofitable matter, and so consequently a dissolution of all the powers.

CHAP. XVIII.

Of the Perturbations or Passions of the Mind.

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

THe Perturbations are commonly called the Accidents of the Mind, because as bodily accidents from the body, so may these, be present and absent from the Mind, without the corruption of the subject. The knowledge of these must not be lightly passed over by the Chirurgeon; for they stir up great troubles in the bodies, and yield 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.

From whence they have 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 examine 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 laughter, unless he formerly knew, or saw somewhat said or done, which might yield 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 blood into all the Body. A great part of which coming to the face, dilates it, the fore-head is smooth and plain, the eyes look bright, the cheeks become red, as dyed 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 blood and spirits; all which, to be brief, is nothing but to laugh.

The reason of Joy.

The effects 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, blood 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 blood and spirits from the heart, into the habit of the body, that sudden and unlook'd for death ensues, by a speedy decay of the strength, the lasting fountain of the vital humour being exhausted. Which thing principally happens to those who are less hearty, as women and old men.

Anger.

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.

Sorrow.

Sorrow, or Grief, dries the body by a quite contrary way 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 blood; wherefore the vital faculty is weakned, the lively colour of the face withers and decays, and the body wastes away with a lingering Consumption.

Fear.

Fear in like sort draws in and calls back the spirits, and not by little and little, as in Sorrow, but suddenly and violently; hereupon the face grows suddenly 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 jaws, the heart beats with a violent pulsation, because it is almost oppress by the heat, strangled by the plenty of blood, and spirits abundantly rushing thither: The hair also stands upright, because the heat and blood are retired to the inner parts, and the utmost parts are more cold and dry than a stone; by reason whereof the utmost skin and the pores, in which the roots of the hairs are fastned, are drawn together.

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.

Shamefastness.

There is another kind of Shame, which the *Latins* call *Verecundia* (we, Shamefastness) in which there

there is a certain flux and reflux of the heat and bloud, 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 Boys, who if they bluſh for a fault committed unawares or through careleſsneſs, it is thought an argument of a vertuous and good diſpoſition.

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 vital faculty 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: Terrours, Frights, and Swoundings, to Fear; Envy, Deſpair, and Mourning, to Sorrow. An Agony.

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, bloud, and heat; from whence happens the diſſipation or oppreſſion of the ſpirits.

The ſigns of theſe Symptoms quickly ſhew themſelves in the face; the heart, by reaſon of the thinneſs 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. Why the firſt ſigns of Paſſions of the mind appear in the face.

Now we have declared what commodity and diſcommodity may redound to the man from theſe fore-mentioned Paſſions, and have ſhewed that anger is profitable to none, unleſs by chance to ſome dull by reaſon of idleneſs, or oppreſt with ſome cold, clammy and phlegmatick humour; 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 fore-mentioned occaſions. The uſe of Paſſions of the mind.

CHAP. XIX.

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

HAving treated of things Natural and not Natural, now it remains we ſpeak of things (which are called) againſt Nature, becauſe they are ſuch as are apt to weaken and corrupt the ſtate of our body. And they be three in number; The Cauſe of a Diſeaſe, a Diſeaſe, and a Symptom. The Cauſe of a Diſeaſe is an affect againſt Nature, which cauſes the Diſeaſe. Which is divided into Internal and External. The External, Original, 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. What things againſt Nature are. What, and how many the cauſes of diſeaſes be. The Primitive cauſe.

The Internal 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 Humours copiouſly flowing, or ready to flow into any part, are the antecedent cauſe of Diſeaſes. The Conjunct is that which actually cauſes the Diſeaſe, and is ſo immediately joined in affinity to the Diſeaſe, that the Diſeaſe being preſent it is preſent, and being abſent it is abſent. Internal antecedent. Internal 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 bloud 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.

But if any will reckon up amongſt the internal, inherent, and inevitable Cauſes, the daily, nay hourly diſſipation of radical moiſture, which the natural heat continually preys upon; I do not gainſay it, no more then that diviſion of Cauſes celebrated and received of Philoſophers, divided into Material, Formal, Efficient, and Final; for ſuch a curious contemplation belongs not to a Chirurgeon, whom I onely intend plainly to inſtruct. Wherefore that we have written may ſuffice him. The congenit, or inevitable cauſe of death.

CHAP. XX.
Of a Diſeaſe.

What a Diſeaſe is, and how various.

A Diſeaſe is an affect againſt Nature; principally, and by it ſelf hurting and depriving the action of the part in which it reſides. The Diviſion of a Diſeaſe is threefold; Diſtemperature, Ill Conformation, and the Solution of Continuity.

A Diſtemperature.

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 fourfold, 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 humours 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.

Ill Conformation.

Ill Conformity is a fault of the organical 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 cavity 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 then 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 mutual 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.

Solution of Continuity.

The third general kind of Diſeaſe, is the ſolution of continuity, a Diſeaſe common both to the ſimilar and organical parts, acquiring diverſity of names, according to the variety of the parts in which it reſides.

CHAP. XXI.
Of a Symptom.

What a Symptom is.

We do not in this place take the word Symptom in the moſt general acceptation, for every change or accident which happens to man beſides his own nature; but more reſervedly and ſpecially, onely for that change which the Diſeaſe brings, and which follows the Diſeaſe as a ſhadow doth the body.

Three kinds thereof.

There be three kinds of a Symptom 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, and when they think Flies, Hairs, and ſuch like bodies fly to and fro before their eyes, is a depravation of the ſight.

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 Jaundice; 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 a humor profitable both in quantity and quality, is againſt nature, as bleeding in a body not full of ill humours, nor Plethorick; and alſo the retention of things hurtful in ſubſtance, quantity, and quality, as the Courſes in Women, the Urine, and the Stone in the Bladder.

CHAP. XXII.
Of Indications.

What Indication is.

The knowledge and exerciſe of Indications befits that Chirurgeon, whom no blind raſhneſs of Fortune but Reaſon, no Chance but Counſel, directs in the undertaking and performing the works of his Art. For an Indication is a certain ſafe and ſhort way, which leads the Phyſician, 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 Artizans, have their peculiar terms and words, which are neither known, nor uſed by the vulgar; ſo this word Indication is proper and peculiar to Phyſicians 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 be done to reſtore health, or repel an imminent danger.

The kinds of Indications.

There are three prime and principal kinds of Indications, every of which is ſubdivided into many other. The firſt is from things Natural. The ſecond from thoſe things which are termed Not Natural. The third from thoſe things which are contrary to Nature. Things natural 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, cuſtom, diet.

Things

Things not Natural may be doubted as uncertain; for one while they indicate the same things with things natural; that is, they co-indicate with the strength, temper, and the rest; otherwhiles they consent with things against Nature, that is, they co-indicate 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 Natural, because we may shun or embrace 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 co-indicates; 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.*

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 Natural, 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 Fever, we are often forced to give sustenance to the Patient, to strengthen the Powers shaken by the vehemency of the shakings, which thing notwithstanding lengthens both the general and particular fits of the Ague. Other pertain to the temper, other respect the habit, if the Patient be slender, if fat, if well fleshed, 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 or use. From all these, as from notes, the skilful 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 near the principal, Neither must thou cure a wounded Nerve and Muscle, after one manner. The temperature of a part, as Moisture always indicates its preservation, although the disease be moist, and give indication of drying, as an ulcer. The principality of a part always 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 ofmer obstructed then 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 Medicins, then peradventure the signs or notes of a great Disease require. For the Physician which applies things equally sharp to the horny tunicle of the eye being ulcerated, and to the leg, must needs be counted either cruel 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 hoarseness and great distillations in very old men, admit no digestion, as *Hippocrates* saith; Indications drawn from things natural. What the conditions of the parts affected do indicate. Indications from the Ages. *Aphor.40. li.2.*

Nunquam decrepitus Bronchum coquit, atque Coryzam.
The feeble Sire, for Age that hardly goes,
Ne'r well digests the hurtful Rheum 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 persuades that a Quartan 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 time; and to increase the credit of the variety and certainty of Indications, some certain time, and seasons in those times command us to make choice of Medicins; for, as *Hippocrates* testifies; *Aphor.6. sect.6.* *Aphor.5. sect.4.*

Ad Canis ardorem, facilis purgatio non est.
In Dog-days heat it is not good,
By purging for to cleanse the bloud,

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 *Rochel* in *Xantoigne*. But the times of diseases yield the principal Indications; for some Medicins are onely to be used at the beginning and end of Diseases others at the increase and vigour of the Disease. We must not contemn those Indications which are drawn from the vocation of Life, and manner of Diet; for you must otherwise deal with the painful 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 onely 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 *Aerius* the *Peripatetick* died suddenly, because compelled by the advice of those Physicians he used, he drank a great draught of cold Water in the intolerable heat of a Fever. 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 Indications taken from things against nature.

of a wound or ulcer indicates one way; the figure cornered, round equal and smooth, unequal 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 humours cause and nourish a Fever. So also a Symptom often indicates contrary to the Disease: in which contradiction, that indication must be most esteemed which doth most urge; as for example sake, If wounding happen in a Fever, the feverish burning shall not hinder us from giving Wine to the Patient.

Wherefore these Indications are the principallest and most noble, which lead us, as by the hand, to do 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 onely one before their eyes, which is drawn from the essence of the Disease, have the report and fame of skilful 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 always follow that which the essence of the Disease doth indicate to be done. But chiefly, then where none of the fore-recited Indications doth resist or gain-say. 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 bloud from a child of three moneths old? Besides, such an Indication is not artificial 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, abundantly teach; which, as by certain limits of circumstances, encompass the Indication which is taken from the essence of the Disease, lest any should think we trust to that only. For there is some great and principal 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 skilful Chirurgeon to know and pronounce. Wherefore he will not vainly bestow his labour to cure the nervous part of the *Diaphragma* or Midriff being wounded, or the Heart, or small Guts, Lungs, Liver, Stomach, Brain, or Bladder; and that I may speak in a word, Empericks are not much more skilful then the common people, although they do so much extol 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 special and proper Indications are drawn; with which the Chirurgeon being provided and instructed, shall not onely 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 meddled withall.

We do not always follow the Indication which is from the Disease.

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

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

But implicit or intricate Diseases require each to be cured in their several order, except some one of them be desperate, or so urge and press that the Physician think it necessary after a 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 enlarge 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 incurable. 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 go, of the use of some voluntary motion. So if in any great joint 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 forced 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 principal 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 humours; Order and Reason require this, that using the advice of some learned Physician 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 oval, 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 lie quietly, having his Leg orderly and decently rouled 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 medicins, 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 drier then 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 applied to the ulcer be drier by one degree then that which the part would otherwise require if it were temperate.

Indications in implicit Diseases.

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.

But

But on the contrary let us suppose thus; the whole body to be one degree more moist than the temper requires, and the ulcerated part to be one degree drier: truly in this case the Medicin that is applied to the Ulcer by reason of the part it self, shall not be increased in drineſs, 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 drineſs. But it is more easie by an artificial conjecture to determine of all such things, than by any rules or precepts. An artificial 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 device; and as the later Physicians term it, a certain subtle 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 Symptoms and Accidents; our Ancestors did the same in curing the *French-Pox*, 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 subtle 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 Physical contemplation, as the Mind. For then, we being destitute of Indications taken 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 perfuaded himself that he was without a head; the Physicians omitted nothing, by which they might hope to take this mad opinion out of his mind. But when they had in vain tried all Medicines, at length they devised this crafty, but profitable device: They fastned 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 errour. Indication from similitude. Indication of a subtle device.

It is reported, another molested by the obscurity and darkneſs of the same Disease, did verily believe, that he had horns upon his head; neither could he be drawn or diverted from that absurd and monstrous opinion, until 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 painful drawing of the bloud that ran down his face, that those bloudy 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 medicinal stratagems, as who forthwith can politickly devise stratagems of divers sorts. A Physician 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 co-indicative, which indicate the same with the Indicative, and jointly shew it to be done, but in some sort secondarily and not primitively. Some are repugnant, which of themselves and their own nature perfuade quite contrary to that the indicative primitively did perfuade us; other correpugnant, which give their voice after the same form and manner with the repugnant against the indicative, as the co-indicative consent to and maintain them. Let this serve for an example of them all: Indications Indicative. Coindicative. Repugnant. Correpugnant.

A *Plethora*, or plenitude of humours, of its own nature, requires and indicates bloud-letting, the Spring time perfuades and co-indicates the same; but to this counsel 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 perfuade, because they have a weaker and but secondary power of indicating, and not essential and primitive. But because the kinds of Indications are so many and diverse, therefore that the knowledge 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.

An Indication is a certain plain and comprehensive way which leads the Chirurgeon to a certain determinate and proposed end for the cure of the present Disease: of which there are three kinds.

- *The first, is drawn from things Natural which indicate their preservation by their like; of this kind are many other which are drawn either*
  - *From the strength and faculties of the Patient,* — *For whose preservation, oftentimes the proper cure of the disease must be neglected; for where these fail, it is impossible the Chirurgeon should perform what he desires and expects.*
  - *From the temperament; as if the Patient shall be* — *Sanguine, Cholerick, Flegmatick, Melancholick,* — *Of preservation of which the Chirurgeon must have care, and if they swerve from equality, to reduce them to that which formerly they naturally were.*
  - *From the habit of the body, as the Patient shall be* — *Dainty and delicate. Slender and weak. Low of stature. Rare or else dense and compact.*
  - *From the native condition of the part or affected part, in which we consider, either*
    - *The Substance thereof, as for as much as it is similar, we consider whether it be hot, cold, moist, dry; or as it is organical, and then whether it be a principal and noble part, or a subordinate and ignoble part.*
    - *Or the sense, whether quick or dull, by reason whereof the eye cannot endure such sharp and acid medicines, as simple flesh can.*
    - *Or the form, figure, magnitude, number, site, connexion, action, use.*
  - *From the Age; for each Age yields his peculiar Indications: hence you may observe most diseases to be incurable in old men, which are easily cured in young; others which in Youth admit of no cure, unless by the change of age and the ensuing temperament.*
  - *From Sex; for medicines work upon Women far more easily then upon Men.*
  - *From the time of the year; for some Meats and Medicines are fit in Winter, some in Summer.*
  - *From the Region; for as there are diversities of situations and habits of places, so also there are motions of humours, and manners of diseases: hence it is that wounds on the head at* Paris, *and sore shins at* Avignon *are more difficult to be cured.*
  - *From the times of Diseases, for some things in the beginning, others in the increase, state, and declining of the Disease, are more convenient.*
  - *From the manner of Diet; for this, as the proper temper, must be preserved. Wherefore such must be fed otherwise who live daintily then those who lead their lives sparingly and hardly. Hereunto add certain peculiar natures, which by a certain hidden property are offended at this, or that kind of meat; for there are some which not only cannot concoct Ptisan, Apples, Soles, Partridge, Water, and such like, but can scarce behold them without nauseousness.*
- *The second is drawn from things not Natural, which one while indicate their preservation by their like, another while their change by their contrary; for so*
  - *If the Air have as it were conspired with the Disease by a certain similitude of qualities to the destruction of the Patient, it must be corrected by its contraries according to Art.*
  - *But if by the disagreement of qualities it resist the disease, it must be kept in the same temper.*
- *The third from things contrary to Nature, which shew they must be taken away by the use of their contraries, as*
  - *The Disease, the Indication being drawn from these,*
    - *The greatness*
    - *The complication or commixtion with other; so*
      - *In implicit, or mixed diseases we may draw Indications from these three heads.*
        - *From that which is most urgent,*
        - *From the cause*
        - *And*
        - *From that, without which the disease cannot be taken away.*

      such are — *Bitterness of pain, a defluxion into a part, a Varix, or big swollen Vein, a distemperature, if they be joined with a disease.*
  - *Cause of the Disease* — *Which two often indicate and require medicines contrary to the Disease.*
  - *Symptom*

CHAP.

CHAP. XXIII.

Of certain wonderful and extravagant ways of curing Diseases.

AS Monsters happen sometimes in Nature, so also in Diseases, and in the events and cures of Diseases. I understand by Monsters certain marvellous successes in Diseases, or certain ways of curing them, which swerve from Art, and happen besides Reason, Nature, and common use. Monstrous Diseases.

Alexander ab Alexandro and *Peter Gilius* tell, that in *Apulia* a place in *Italy*, they have a certain kind of Spider very frequent, the Natives call it *Tarantula*, *Petrus Rhodius* calls 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 falls 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 chearfully, and dances so long to their measures and tunes, until by the painful and continued shaking and agitation of the whole body, all the malignity is dissipated by transpiration and sweats. The wonderful force of the bite of a certain Spider. 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 rose up again and continued his dancing till the perfect dissipation of the venom. And that it hath happened besides, that one not 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.

Some affirm according to the opinion of *Asclepiades*, that such as are frantick are much helped with a sweet and musical 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* tells, That *Crœsus* 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 endeavouring to cry out, and with that striving and forcing of the spirit, he broke the bonds and hindrances of his tongue, and spoke plainly and articulately, crying out to the Enemy that he should not kill King *Crœsus*. 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*, tells, 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. Musick gives ease to pain. A strong perturbation of the mind helps by moving the spirits.

Quintus Fabius Maximus, as *Livy* writes, was long and very sick of a quartan Ague, neither could have wished success from Medicins administred according to Art, until skirmishing with the *Allobroges*, he shaked off his old feverish 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 *Lansack*'s Chamber, that there was a French Gentleman in *Polonia*, who was grievously tormented with a quartan Fever, who on a time walking on the Bank of the River *Wexel*, 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 Quartan never troubled him after. King *Henry* the Second commanded me to go from the Camp at *Amiens* to the City *Doelan*, 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 Quartan Ague, yet would he be present at the fight, in which he being shot through the side of the neck with a Bullet, he was strucken with such a terrour of death, that the heat of the Fever was asswaged by the cold fear, and he after lived free from his Ague. Chance sometime exceeds Art.

Franciscus Valeriola the famous Physician of *Arles* tells, That *John Berlan* his fellow-Citizen troubled with a Palsie 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 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 years before. He tells the like in the same place of his Cousin *John Sobiratius*; he was a long time lame at *Avignon*, 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 sudden passion of anger against one of his Servants whom he endeavoured 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 time after he remained sound. *Observ. lib. 2.*

Galen tells, he was once fetched to stanch the bleeding for one who had an Artery cut near his Ancle, and that by his means he was cured without any danger of an *Aneurisma* (*i.e.*) a relaxation of a veinous vessel; and besides, by that accidental wound he was freed from a most grievous pain of his hip, with which he was tormented four years 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 Ancle *Cap. ult. lib. de cur. rat. per. sanguinis miss.* *Galen* by a dream cures the Sciatica.

Ancle 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.

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

At *Paris*, *Anno* 1572. in *July*, a certain Gentleman being of a modest and courteous carriage, fell into a continual Fever, 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 *Valterra* the Duke of *Alenzons* Physician, 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 Physicians, *Alexis*, *Magnus*, *Duretus*, and *Marenus*. 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 *Montpelier*, and the King's 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 Patients headlong out of a window, but would rather cast them suddenly, and thinking of no such thing, into a great Cistern filled with cold Water, with their heads foremost, neither would I take them out until they had drunk a good quantity of Water, that by that sudden fall and strong fear, the matter causing the Frenzy might be carried from above downwards, from the noble parts to the ignoble; the possibility of which is manifest by the fore-cited 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 jugling and deceitful ways 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 knowledge 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 knowledge 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 fatigation, he subjects all things to his knowledge. 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 away the credit in tilting, onely because he was got by a Gentleman, and one famous in the Art of War.

A most impudent sort of Impostors.

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 onely 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 Countreymen so easily crediting so great and pernicious an errour; not observing the inviolable Law of the ancient Physicians, and principally of Divine *Hippocrates*, by which it is determined, that three things are necessary to the setting of Bones dislocated and out of joint; to draw the bones asunder, to hold the bone receiving firmly immovable 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, left 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 artificial Engins?

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 *Bombruch*, 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 Weapon with which any is hurt; they lay it 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 Medicin applied 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 Medicin; 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 believe that it was done Naturally, and by Reason, but rather by Charms and Magick.

In the last assault of the Castle of *Hesdin*, the Lord of *Martigues* the Elder, was shot through the Brest

Breſt with a Musket bullet. I had him in cure together with the Phyſicians and Chirurgeons of the Emperour *Charles* V. and *Emanuel Philibert* the Duke of *Savoy*, who becauſe he entirely loved the wounded Priſoner, cauſed an Aſſembly of Phyſicians and Chirurgeons to conſult of the beſt means for his cure. They were all 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 bloud 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 Honourable Perſonage being in this deſperate caſe, was committed unto his care. Firſt of all, he bid they ſhould give him the Patients ſhirt, which he tore into ſhreds and pieces, which preſently framing into a Croſs, he laid upon the wounds, whiſpering ſome conceived or coined words, with a low murmur. 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 Phyſicians 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 Oil 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 trial was made were ſimple ones, which onely required union, or cloſing for to perfect the cure. So verily the bones of Beaſts when they be broke, grow together by the onely benefit of Nature. But when the affect ſhall be compound by diverſity of Symptoms, 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 freedom in a free and Chriſtian Commonweal. What wounds may be cured onely 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, Magical Ligatures, Rings, Images, Poyſons, Laces tied 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 conſulteth with Spirits, or a Soothſayer, or that asketh counſel 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 believe 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 blind, 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 Diabolical 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.

BOOK

BOOK II.

Of Living Creatures, and of the Excellency of Man.

The difference of brute Beasts

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 fearful; some wild 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 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. Bulls are formidable by their Horns. The Boar by his Tusks standing out, as it were natural Hunting-spears. The Hare being a timorous 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 supplied in the fearful by nimbleness and celerity. Infinite are the other endowments of brute Beasts, and such as can hardly be 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 hurtful, 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 Vocal Musick, prudent and careful for their young, and faithful 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 depel the contrary, being in this their own Counsellors, and not tutored by Man. Yea, Man is beholden to them for the knowledge of many wholsom 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 onely know, but reverence their Masters.

Some shadow of Vertue in Beasts.

Lib.8. Cap. 27. But from whence is the knowledge 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 *Dictamnus*, in drawing Darts out of the flesh, was taught us by the Hart, who wounded with the Huntsman's Darts or Arrows, by means hereof draws out the Weapons which remain sticking in her. Which is likewise practised by the Goats of *Candy*, as *Aristotle* writeth. The wonderful effect which *Celandine* hath upon the sight, was learnt by the practice of Swallows, who have been observed with it to have besmeared, and so strengthened the eyes of their young. Serpents rub their eye-lids with Fennel, and are thought by that means to quicken and restore the decaying sight of their eyes. The Tortois doth defend and strengthen her self against the biting of Vipers, by eating of Savory. Bears, by eating of Pismires, expel that Poison that they have contracted by their use of Mandrakes. And for correction of that drowsiness and sloth which grows upon them by their long sleep in their Dens, they eat the herb of *Aron* (i.) Cuckopint. But the Art they use in the inticing and catching of Pismires is very pretty: they go softly to the holes or hills 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 expel 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 sorts of Pullen disburden themselves of gross humours 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 hurtful humours, he fills his Bill with Salt Water, 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 yield 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 Phlebotomy we owe unto the *Hippopotamus* 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 Bank side, open a Vein, whereby the superfluous bloud 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 dreadful 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

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.

Feathers

Feathers. They were perſuaded 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 Lightning. It were a thing too long and laborious to ſpeak of all thoſe other manuments of life and health (obſerved here and there by *Ariſtotle* and *Pliny*) which we have learnt of brute Beaſts. I will therefore end this Chapter, after that I have firſt added this; That we are beholden to Beaſts not onely for the skill of curing Diſeaſes, and of preſervation of Health, but for our Food, our Rayment, and the Ornament and Beautifying of our Bodies.

Of the Faculty of brute Beaſts in Preſaging.

THe firſt knowledge 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 daily obſervation, that it is a ſign of change of Weather when Lambs and Rams do but 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 Ox licks himſelf againſt the hair, and on the ſudden fills the Air with his lowing, and ſmells 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 Moles, and the Cats rubbing and ſtroking of her head and neck, and above her ears with the bottom 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 ſudden ſtorm and tempeſt. Whereby the Mariners fore-warned, 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 bating of Rams ſignifies.

Preſages of Rain.

The ſign at Sea of a ſtorm at hand.

But the faculty of Birds in this kind of preſaging, is wonderful. 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 fly ſtraglingly. As alſo if Sea-Fowl fly far from the Sea, and light on the Land. The cry or ſhrieching 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 Showrs, as alſo when he ſtaps 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, fore-tell rain; and in like manner Swallows, when they fly ſo low about the Water that they wet themſelves and their wings. And the Wren, when he is obſerved to ſing more ſweetly than uſual, 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 then ordinary. If the Heron ſoar aloft into the Air, it betokeneth fair Weather; if on the contrary he fly cloſe by the Water, rain. If Pigeons come late home to the Dove-houſe, it is a ſign of rain. If Bats fly in the Evening, they fore-ſhew wet Weather. And laſtly the Crocodile lays her Eggs in that place which muſt be the bounds of the overflowing of the River *Nilus*; and therefore he that firſt meets with theſe Eggs, tells the reſt of the Countrey People, and ſhews 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.

The Crocodile by laying her eggs ſhews the bounds of the River *Nilus*.

Of the Induſtry of Fiſhes.

MAny Sea-fiſhes, when they feel a tempeſt coming, do gravel or baliſt 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 Fiſhes provide for their ſafety againſt a ſtorm.

How they ſwim againſt the ſtream.

Of the Induſtry of Birds in the building of 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 Wool 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 things that ſhall ſtrike againſt them, and likewiſe more capacious. They chuſe 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 labour; 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 began 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 trial 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 Kids 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.

Of what things Birds build their Neſts.

In what ſhape.

With what care Sparrows feed their young.

Of

Of the Industry of Spiders.

How the Spiders weave,

THe Spider spins her Web with wonderful 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 doth she, nor will she desist from the work she hath begun, but in a very short time weaves a great deal more unto the ruines of her former work, than can be unweaved again with much labour. 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 thread, 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, whereby 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 eyes, it would be thought fabulous.

How they catch their prey.

Of Bees.

Bees chuse 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 Regal 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 alway, environed with a Princely Retinue, the rest of his Train following after, neither goes he at any time abroad, but upon urgent affairs which concerns the whole State. His progress is fore-warned 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.

Their obsequies for their dead King.

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 several rites and obsequies, they chuse themselves another King, for without a King they cannot live. He then taketh care of all things, having his eye every where, whilest 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 chuse a clear and fair day; for they have a natural 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 safeguard of themselves and their Hives.

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 labours, so long, till that one (who is appointed to this charge) by one or two hums, as by the sound of a Trumpet, rouzeth 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 dewy 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 until 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 wind. They are exceeding diligent in all their business, and do punish the sloth of the Lazy oftentimes with death. Some of them are the Builders, others polish the Building, and the rest bring in their Materials.

Their watch.

Their divers imployments.

The building in their arched Hives is with wonderful 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 labour, should give occasion of dissension. 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 labours, 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 the Owners wonderful increase of Wax and Honey.

They punish Sloth with banishment.

Aristomachus a diligent observer of Bees.

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

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 well-governed and well-ordered Common-weal. For how pretty a sight is it to see them when they seize 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 big 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 knowledge of heavenly things. *Pliny* af-

Prov. 11. & 30.

Wonderful care.

firmeth

firmeth 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?

From whence we may note, what in all kind of things is the affect of the aſſiduity. They ſay alſo that they perform the rites of burial one unto another, after the manner of men. 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 Vertues. Their great meetings argue that they maintain a kind of Friendſhip.

There is nothing but may be attained by diligence.

Their alacrity in the undergoing of their labours, ſeem to ſhew their fortitude and magnanimity; and laſtly, they are eminent examples of Temperance, Providence, and Juſtice. Their mutual 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 in the end will bring you to three little Cells; 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 join that of the Silk-Worm, 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 Knowledge, 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 onely 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 Partridges this way is much commended; for during the time that their young ones are weak and unable to fly, they teach them to lie 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 Falconer. 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 Partridges 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 Cannibals *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 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 *Theves* Coſmography.

How Hares provide for themſelves and their Young, for fear of Hunters.

Neither are thoſe things leſs wonderful that are reported of Hares, for when they would go to their ſeat, 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 Hedg-hog; 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 Hedg-hog to provide for her Young.

In the time of Vintage he goes to the Vines, and 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 burden 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 flie, they will give him their aſſiſtance, and bear him on their backs and wings. And therefore this affection and piety towards the old one, 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 flie in the eyes 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 infinite 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 mutual bond of love between Turtles; for if one of them die, the ſurviver never ſolicits Hymen more, neither will he ever chuſe other ſeat than a dry withered Bough.

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 infinite thing to ſpeak of all) ſee in what kind of mutual 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 Emperour 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 Bells, that by the noiſe of theſe Bells the people may be fore-warned 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 delightful 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 wonderful 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 domeſtical 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

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 ſhewn 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 wonderful thing what Stories Natural Philoſophers tell of the Vertues of the Elephant.

Lib.8.cap.1. *Pliny* writeth, that an Elephant cometh very near to the understanding that Men have, and that he hath a rude kind of knowledge of Language; that his facility and obsequiousness is wonderful; that his memory in the performance of his wonted duties, is no less wonderful. And for

The Religion of the Elephant.

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. *Pliny* addeth, that they do with the like reverence worship the Moon and the Stars. For it is related in the History 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*, against the Panegyrick Shows, 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 often-times observed in the night, by the light of the Moon, to be practising and conning what he 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. c.5.

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 onely because he would leave no mark in his feet, whereby he may be traced and so taken, but because by continual walking he should wear off, and blunt the points of his Claws. Bulls when they fight, charge one another with their horns, and like valiant Souldiers provoke and animate one another to the Battail.

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 Armour, especially when he is to encounter with the Crocodile; who although he be 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 a 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.

The greatest are terrified by the least.

Of Cocks.

Cocks are Kingly and martial Birds.

COcks are Kingly Birds, and therefore Nature hath adorned them with a Comb, as with a Princely Diadem; and wheresoever they come, their magnanimity and courage makes them Kings. They fight with their Beaks and their Spurs, and with their martial 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 to 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 sandy 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 and 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 lie 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, until he hath gotten them unto the place where their ambush lieth, which on a sudden 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 eyes 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 Perch, he hath this device; 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 warines when he passes over a River that is frozen, is wonderful; 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 knowledge 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

The Fox seems to reason with himself.

His Syrites.

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.

That men are taught by Beasts to polish and to whet their weapons, and to lie in ambush.

SOuldiers are careful to keep their Weapons from rust, and therefore they carry them to the Armourers to be polished. But in this care, many Beasts are nothing inferiour unto 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 *RHINOCEROT* his Enemy. But the craft of

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

the Rhinocerot is very remarkable, that being in continual enmity with the Elephant, at the time when he prepares for the battel, he whets his horn againſt a Rock, as 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 equal to the Elephant, but in height he is inferiour unto him, by reaſon of the ſhortneſs of his feet; he is of a paliſh yellow colour, and full of many ſpots.

Of Swine.

SWine, if in the Woods, they hear any one of the ſame Herd with them crying out, they ſtrait make a ſtand; and marſhalling their Forces, haſte all, as if they had been warned by the ſound of a martial 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 readineſs of the *Anthiæ* to the mutual aſſiſtance of one another, is yet more manifeſt; for by caſting the line upon which the hook hangeth on their back, with the ſharpneſs of their Fins they cut it aſunder, and ſo ſet free themſelves and their captived fellows.

Of the Pilot-*fiſh.*

The Whales Pilot or Guide

THere is a great kindneſs 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 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 follow 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.

Of Cranes.

Cranes order themſelves in ranks.

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 flie. They come together, and then flie up on high that they may ſee afar off, chuſing 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* tells us, that the Crane, which is appointed to ſtand Sentinel 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 awaked 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 befal 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 eaſilier prevail againſt the force and oppoſition of the Winds, they diſpoſe their company into a Wedge in the form of the Greek letter Δ, or a triangle; and being skilful in the Stars, they fore-ſee when tempeſts are coming, and fly down to the ground to keep themſelves from the injury of the approaching ſtorm.

The Sentinel Crane.

Of Geeſe.

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

THe Geeſe of *Sicily* 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, until that they come unto a place where they may be ſecure.

Of Dragons.

The craft of Dragons fighting againſt the Elephant.

NEither are the Dragons leſs crafty; for thus do they overcome thoſe vaſt and otherwiſe invincible Beaſts the Elephants. They lie in ambuſh, and ſuddenly ſet upon the Elephants when 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 eyes, and whereſoever they find the skin moſt tender there they bite and ſuck the bloud until 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.

Lib. 8. c. 11, 12.

Of the Fiſh called the Fiſherman.

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

THis fiſh is called the Fiſherman, becauſe he hunts and takes other Fiſhes, which he doth almoſt by the ſame cunning which the Cuttel uſes; for he hath hanging at his throat a certain bag, like the Wattels of a Turkey-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, until he catch for food the little Fiſhes ſeiſing upon it as a prey.

Of

Of the Cuttel Fish.

WOnderful is the craft of the Cuttel-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 eyes of the Fishermen, as *Plutarch* saith, and as *Aristotle* witnesseth, they with their long fangs do not onely hunt and take little Fishes, but oftentimes also Mullets. The craft of the Cuttel to save her self. *Lib.9. de Hist. Animal.c.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 onely 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 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. *Cosmogr. tom.1. lib.10.c.10.*

Of the Fish Utelif.

HE saith moreover, that as he was carried 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 Cassily.

THere is another Fish to be seen in the *Arabian* Gulf which the *Arabians* call *Cassily*; it is two foot long, and many broad; it hath a skin not much unlike a Dog-fish, 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 chissel: 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 onely 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 Jugglers Hoops, and rise on their hinder feet, as though they would dance. *Plutarch* tells 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 soporifick 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 waxed stiff; and moreover suffered himself divertly to be fitted according to divers parts of the Theatre, 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 rose up, and went familiarly and chearfully to him he should. Than which sight the Emperour *Vespasian* (who was then present in *Marcellus* his Theatre) never saw any which more delighted him. The wonderful 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 endeavour 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 mild 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 doctrin 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 Sharpner 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 skilful 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 reverendly carried up Dishes with the Waiters and Servingmen, 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 casting his eyes 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 *Gal. lib.1. de usu partium.*

that

that offended him, for his Coat scarce covered half his buttock, lest he should have defiled 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.

Of the Camel.

Camels both tame and wild

THe *Camel* is a very domestical and gentle Beast, and which is easily tamed and taught all kind of obedience and service; although some of them are cruel, wild, and troublesom by biting and striking such as they meet, no less then 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 Thistles, neither in the morning do they any whit the worse undergo or carry their burdens. They are not put to carry burdens before they be four years old. The *Arabians* geld them young, that they may enjoy their labour the longer; neither being gelt,

The ease and not chargeable keeping of Camels.

gelt, do they rage for Love or desire of Venery. At the putting in of the Spring they endure hunger and thirst for eight days together; they are so dutiful, that at the beck of the Turkish Slaves, or but touched on the neck with a Twig, they presently kneel on the ground to take up their burden, neither do they lift themselves up before they find that 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, 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 herds 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 former times was called *Memphis*) that there then was in that Emperours Army sixty thousand Camels, besides a mighty company of Mules.

Camels know when they have a sufficient load.

Camels both to carry burdens, and to ride upon.

A mighty troop of Camels.

Of ravenous Birds.

BUt let us take view of Falconers teaching ravenous Birds, how with swift wings carried aloft into the Air, they may seize upon other Birds, and cast them down dead to the ground; in performance whereof, they often too freely soar 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 diligence of Falconers in training up their Hawks.

The Heron when she sees her self kept under, and below the Falcon, carried up by his strong wings with a marvellous 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, carelessly 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 Heron 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.

The fight of the Heron and Falcon.

That Birds have taught us Musical Tunes.

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 musical Instruments; so that we say, he sings like a Nightingale, who varies his voice with much variety. In which thing Birds much excel men, because they have that admirable sweetness of singing from Nature it self without any labour of learning; which men can scarce attain to in any School of Musick, by having their ears a thousand times pluckt by the hands of a curst Master.

To sing like a Nightingale.

That Beasts know one anothers voice.

BEasts know one another by their voice, so that they may seem to talk and to laugh together, whilest fluttering with their ears, they pluck in their noses with a pleasant aspect of their eyes; and as speech is given to men, so Birds have their natural 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 travel 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, Eyes, Hands, and Feet. Truly the condition of brute Beasts is not so miserable, seeing that all of the same kind wheresoever 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 judge, whether he heard the voice of Men or of Beasts.

The Voice of Beasts is of the same use, as Speech is to Men.

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

That Birds may counterfeit 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 excel all other, being wondrous skilful imitaters of mens voices; and very merry, but specially when they have drank a little Wine.

Parrats are wonderful imitaters of Mans voice.

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; she imitated the voice or cry of all Beasts she heard, as also the sound of Drums, and the sound of Pipes and Trumpets; to conclude, there was nothing which she did not endeavour to imitate. There have been Crows that have spoken and articulately sung Songs and Psalms, and that of some length. To which purpose the History of *Macrobius* is notable; for he tells 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 Emperour Cæsar.*

A talking Pie.

Lib. 2. Saturn. cap. 4.

Cæsar

Cæsar taken with the novelty of this spectacle, bought this obsequious Bird with a thousand pieces of Silver. *Pliny* and *Valerius* have reckoned up amongst prodigies, Oxen and Asses that have spoken. I omit infinite 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 (than which nothing is more base) the rest of their Writings to posterity in all ensuing Ages.

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 knowledge, happening unto them by reason of Sympathy and Antipathy; that is, mutual agreement and disagreement, which happens not onely to them living, but also dead, by a certain hidden property, through occasion whereof some desire, others 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 onely terrified by his presence, but also by his crowing being absent. So an Elephant fears an 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 endure his sight. The Dog hates the Wolf, the Hart flies the Dog. The Snake flies from and fears a naked man, and follows him being clothed. There is deadly hatred between the Aspis and Ichneumon; for he when he hath rouled 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, until he get opportunity to choak his adversary by leaping and fastening on her Jaws, by which stratagem he also kills the Crocodile. The green Lizard is a capital 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 Weasel intend to set upon the Aspis that most venemous Serpent, she 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 pretily 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, then take wing to flie into the air. So the Lark yields her self to be taken by a Man, lest she fall into the Talons of the Hobby. The Castril, or Merlin, is naturally a terrour to Hawks, so that they both shun his voice and presence.

The Lion fears a Cock.

A Horse fears a Camel.

What Fowl fear the Falcon.

The Kites are all at perpetual enmity with the Crows, wherefore the Crow always gets away the Kites provision. All kind of Pullen fear the Fox. The Chicken fears neither a Horse nor 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 Lamb and Kid flie from the Wolf when they first see him, neither doth Death give an end to that hatred, but it supervives their Funeral. 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 Sheep skins. And besides, if you string one Harp with Strings made of Sheeps guts, and another with Strings of Wolves guts, you cannot bring 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, until all such kind of terrour be taken away. The hate betwixt Mice and Weasels appears by this, that if you mix never so little of the brains of a Weasel in the Rennet, with which you cradle your 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 tie 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 same species do wonderfully consent one with another.

The Enmity between the Kites and Crows.

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

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 natural 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 onely 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

than 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 always some beam of the Divine Wisdom will be inherent and 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 equal the fortitude of Man. For God hath engraven in Man the Character of his Divine Virtue, 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 onely 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 Eternal Life, (as *Lactantius* saith) whereby it comes to pass, that Man onely, amongst so many Creatures, hath sense and understanding of Divine things. Which *Cicero* thought to be known by that, because Man onely had a certain knowledge of God in his mind. Wherefore he was enriched 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 excells all brute Beasts. For first, Reason being his guide, he invented things necessary for life, fitly imposed names on the things invented befitting their Natures, framed Letters and Characters, invented all Liberal 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 Celestial Globe, the distinctions of the Stars; the changes and orders of Days 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 perpetual 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.

Man 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 needful, and enriches his Mind with the knowledge of Arts and Sciences. Now if he had certain Weapons born with him, he should use them onely; if he should be born skilful 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 skilful 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 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 excel all other Instruments. For so Man hath 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 Bulls Horns, the Boars Tusks, 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 Hand-gun, when the Horn and the Hoof cannot be used but near at hand. But some may say, a Lion 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 Lion, 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 Lion with what Weapons he pleases. To conclude, Man is abundantly provided with means to defend himself from the violence of all other Beasts. For this purpose he doth not onely harness himself as with brazen Walls, but also makes Ditches and Bulwarks, he makes by the ministry 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 lie 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.

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

As the Hand is the Instrument of Instruments, so Reason is the Art of Arts.

Man under God is the King and Emperour of the World.

How wonderful 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 onely 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 *Microcosmus*, 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

Why Nature hath not given Man the faculty of Presaging.

Man is not obnoxious to the Air and Stars.

THis seems the reason, that Men by the instinct of Nature do not foresee the future seasons and dispositions of the Heaven and Air; because, seeing they have received certain sparks of prudence from God, by whose care and guidance they are led to the knowledge of things by no deceitful 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 serene and grave meditation of things sublime and full 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 humours 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 bark like Foxes and Dogs; grunt like Hogs, whet and grind their teeth like Boars, roar like Lions, bellow like Bulls, neigh like Horses, knack their teeth like Apes, howl like Wolves, bray like Asses, bleat like Goats and Sheep, mourn like Bears, Pigeons, and Turtles, keek and gaggle like Geese, hiss like Serpents, cry like Storks, caw like a Crow, and crow like a Cock, clock like Hens, chatter as Swallows and Pies, sing like Nightingales, croak like Frogs, imitate the singing of Wasps and humming of Bees, mew like Cats. The singing of Birds scarce seems to merit the name of Musical, compared to the Harmony of Men, fitted and tuned with infinite 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 transform them into what habits they please. But if those cruel Beasts have any humanity, they owe it all to Man: For he tames Lions, Elephants, Bears, Tigers, Leopards, Panthers, and such other like.

One Man will counterfeit the voices of infinite varieties of Beasts.

The power of Musick.

That Man may attain unto the knowledge 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 onely able to learn to speak the Tongues of divers Nations differing in so many peculiar Languages; and not onely 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 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 Knowledge, 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 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 onely the imitater, but the interpreter of the Voices of Beasts and Birds.

But for Crows and Pies artificially taught to counterfeit mens Voices, 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 always contemplating somewhat more high, still thinks of greater things than these present, and never rests. But burning with an infinite and endless desire of Knowledge, he doth not onely covet to know those things which appertain to food and cloathing, but by casting 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 celestial original of our Soul, that he which considers those things, can no ways doubt, but that we have our minds seasoned by the universal Divine Understanding. But now it is time for us to set upon the Description of the Body, the habitation and fit Instrument of all the Functions of the Divine Mind.

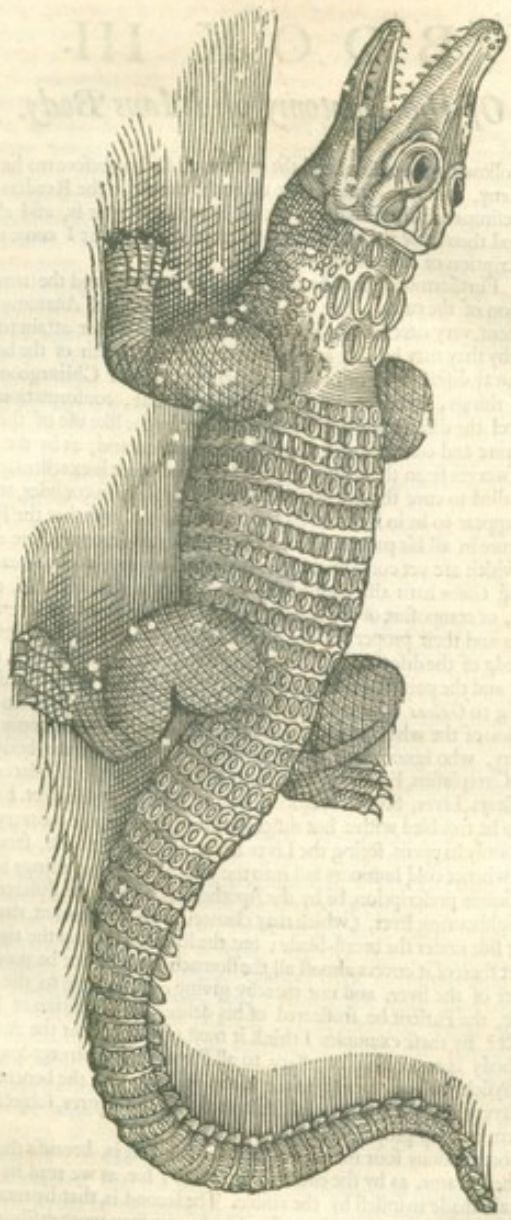
The unquenchable desire of Learning in Man.

Of the Crocodile.

A tame Crocodile.

Plutarch reports of the Crocodile (whose Figure is here delineated) that being tamed, and taught by Man, he doth not onely 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 Towel. 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 practice of a few years, can learn at his fingers ends all the parts of Physick; and practise them not onely for his own, but also for the common good of all men. But why cannot Beasts attain unto the knowledge of Physick so well as Men? I think, because so great 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 knowledg of ſublime things, or of God, ſeeing they wholly following their food, know not how to meditate on celeſtial 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 entrails 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 knowledge of Divine Worſhip implanted in their minds.

In what ſenſe we ſaid, Elephants had Religion.

The end of the Second Book.

BOOK III.

Of the Anatomy of Mans Body.

The neceſſity of the knowledg of Anatomy.

IFollowing 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.

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 excel, 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 Phyſician or Chirurgeon preſerve health by the uſe of the like things, which conſiſts in the temperament, conformation and natural union of the parts; or expel 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 Phyſician, 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 well know the nature and ſtructure, or compoſure of the bones, who takes upon him to reſtore them broken or diſlocated to themſelves 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 natural diſſimilitude, do require unlike medicines, according to *Galens* opinion: I prethee tell me, 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 futures of the skull, to the Heart, Liver, Stomach, Spleen, Reins, Womb, 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 ought to be, ſends up many vapours to the head; from whence cold humours fall into the ſtomach) if hot things to be applied to the ſtomach by the Phyſicians preſcription, be by the Apothecary, making no difference, applied, to both the ſtomach and neighbouring 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 he not be 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 Phyſician of his intent, and the Medicine of its effect? By theſe examples I think it moſt manifeſt, that the Anatomical knowledg of the parts of the body is exceeding neceſſary to all Phyſicians, 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 ways.

But Anatomy is commodious four manner of ways: 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 judge and determine of ſickneſs and health. The third is, that by the knowledg of the body and its parts, and together therewith it affections and diſeaſes, we may prognoſticate what is to come, and foretel 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 place.

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 natural 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 Anatomical Adminiſtrations, 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 Anatomical 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 faithful underſtanding them. For, I will adjoyn thoſe things that are delivered of them by *Galen* in his Book of Anatomy-Adminiſtrations, with thoſe which he hath taught in his Books of the uſe of the parts. For there he fitly lays 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,

The Authors intent.

we

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 eſſential 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.

What Anatomy is.

Wherefore Anatomy (if you have regard to the name) is a perfect and abſolute diviſion, or artificial reſolution of mans body into its parts, as well general as particular, as well compound as ſimple. Neither may this definition ſeem illegitimate; ſpecially amongſt Phyſicians and Chirurgeons. For, ſeeing they are Artizans humiliated to the ſenſe, they may uſe the proper and common qualities of things for their eſſential 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 eſſential 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 eſſential form of the thing, it preſents us only the matter adorned with certain accidents. This appears by the former definition, in which *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 unartificial diſſections. We muſt know, an artificial diviſion, is no other than a ſeparation of one part from another, without the hurt of the other, obſerving the proper circumſpection of each of them; which if they periſh or be defaced by the diviſion, it cannot be ſaid to be artificial. And thus much may ſuffice for the parts of the definition in general.

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 depel 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 part, according to *Galen*, than ſome certain body, which is not wholly disjoyned, nor wholly united with other bodies of their kinds; but ſo, that, according to his opinion, the whole be 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 general*, 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, artery, 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 ſhall find 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 uſ. part.* lib. 1. Meth. 1

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 *Periоſteum*, as by whoſe mediation the *Periоſteum* is connext to the bones, as we ſee it happens to thoſe membranes, which involve the bowels. And the bones, by this benefit of the animal ſenſe, expel the noxious and excrementitious humors from themſelves into the ſpaces between them, and the *Periоſteum*, 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 organical, or inſtrumental; as an arm, leg, hand, foot, and others of this kind.

How the bones come to feel.

The compound or organical 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 inſtrumental and organical, 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 organ, but not any part of it, as the coats, which cannot of it ſelf perform that act. Whereby we muſt underſtand, that in each inſtrumental part we muſt diligently obſerve four proper parts. One by which the action is properly performed, as the Cryſtalline himor 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 are. 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 principal 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 particles to be obſerved in each organical part.

But we muſt conſider, that the inſtrumental 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

Four ſorts of inſtrumental parts.

are compoſed of parts of the ſecond order, and ſome beſides, as the hand taken in general. 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 ſhall underſtand they are truly compound, as we ſaid before. Now it remains, that we underſtand, 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 original 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.

Nine things to be conſidered in each part.

Why the three principal parts are ſo called.

But alſo we muſt note, that of the organical parts, there be three, by whoſe power the body is governed; which for that cauſe they call regent and principal, becauſe they govern all the reſt; they are the Liver, Heart, and Brain. But they are called principal, 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 vital 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 individual, 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, he makes them the more noble by this reaſon, that by how much it is better to live well 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 and pleaſantly, but with this ſimply live; as we ſee by the example of Eunuchs, 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 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 theſe many thouſand of years, and ſhall 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 enticed to mutual 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 mortal, it hath done what it could to recompence that fatal neceſſity of dying, by a perpetual ſucceſſion of Individuals.

The uſe and function of the parts ſerving for generation.

Hitherto we may ſeem to have abundantly ſhewed what neceſſity of knowledge in Anatomy belongs to all Artizans in Phyſick, and alſo what order is to be obſerved in the 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 knowledge of Anatomy may be perfected by the ſight of the eye, and touching and handling each part with the hand, yet nevertheleſs the labour 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 general diviſion, into three faculties, which are, the Animal, Vital and Natural. But the Animal is divided into the principal, ſenſitive and motive: Again, the Principal 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 Natural is parted into the nutritive, auctive, and generative faculties; which three perform their parts by the help and miniſtry 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

After the self-same manner, the organ or instrument of the soul, to wit, man's body, at the first division is distinguished into three parts, which from their office they call Animal, Vital and Natural. These again, according to the sub-division of the subalternal 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 man's body into four universal 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 writing of Anatomists; for shunning whereof, we will prosecute, as we have said, that distinction of man's body, which we have touched before. All the parts mans body are distinguished into three.

Wherefore, as we said before, man's body is divided into three principal and general parts, Animal, Vital, and Natural. By the Animal 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 Animal. 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 man's body, as, if she hath well framed the head, it should not be unlike that she idly or carelesly 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 animal parts, but also the veins and arteries depend on the head as the original. 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 Animal. Lib. 6. Epid.

By the Vital parts, we understand only the heart, arteries, lungs, wind-pipe, and other particles annexed to these. But by the Natural, we would have all those parts understood which are contained in the whole compass of the *Peritonæum* 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 Animal, which notwithstanding, we must thus divide into principal, sensitive, and motive; and again, each of these in the manner following: For first, the principal 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 after-brain, with a ventricle hallowed in its substance. Secondly, The Sensitive is parted into the visive, which is in the eyes; the auditive in the ears; the smelling, in the nose; the tasting, in the tongue and palat; the active, 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 Vital, 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 vital motion, as are the heart and arteries, furnished with these fibers, which we formerly mentioned. The division of the natural parts remains, which is into the nourishing, auctive, and generative, which again, are distributed into attractive, universal 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 kidneys. 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 womb, supplying the place of prostates: Lastly, they expel or cast forth by the prostates, horns, and adjoyning 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 universal, but that the general are performed by the assistance of the three sorts of fibers; but the special, by the several occult property of their flesh, arising from their temperature, which we may call a specifick property. Now in the composition of man's 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 and 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 privy parts, testicles and womb. And this is my opinion, of the true distinction of man's body, furnished with so many parts, for the performance of so many faculties; which you, if you please, may approve 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, breast, and lower belly) and the limbs or joints. In which, by the head we do not understand all the Animal parts, but only those which are from the crown What parts are called Vital. The division of the animal parts. The division of the vital parts. The division of the natural parts. The vulgar division of mans body.

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 breast, whatsoever is contained from the collar bones to the ends of the true and bastard, or short ribs, and the midriff. By the lower belly, the rest of the trunk 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 Anatomical Discourse, because we cannot follow the former in dissecting the parts of mans body, by reason the Animal parts are mutually mixed with the Vital and Natural: And first of the lower belly.

The Figure shewing the fore-parts of the body.

A The hairy Scalp, call'd τριχωτὸς.
b the forehead, call'd *Frons*, μέτωπον.
c The temples call'd *tempora*, κρόταφοι.
From *b* to *d*, the compass of the face.
e The greater or inward corner of the eys, call'd *Canthus internus*.
f the lesser or external angle of the eye, call'd *Canthus externus*.
* The lower eye-brow, which is immoveable, *Palpebra*.
g The cheek-ball call'd *mala*, μῆλα.
h the cheek-puff, call'd *bucca*, γναθὸν.
i The ridg of the nose call'd *Nasus externus*, ῥὶν.
k the nostrils call'd *nares*, μυκτῆρες.
l the outward ear, *auris externa*.
m The mouth made of the two lips, *Os*.
n The chin call'd *mentum*, γένειον.
o The neck, *collum*, αὐχὴν, and τράχηλος.
From *o* to *e* the pillar of the neck, *truncus* and ὄμφαλος.
p p The hollow of the neck called *juguli*, σφαγαὶ.
q q The Patel bones, *claves*, κλεῖδες.
r The chest, *pectus*, στέρνον.
ſ The right breast.
ſſ The left breast: to this Region we apply cordial *Epithemations* moist and dry.
tt The nipples of the breasts, *papillæ*, θῆλαι.
u The trench of the heart which the Ancients 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.
y y The *Hypochondria* or *Præcordia*.
* The outward Liver-remedies are applied to this place.
z The region of the navil, called *umbilicalis*, or the middle part of the lower belly.
A The navil, *umbilicus*. The root of the belly, ὄμφαλος.

BB The sides, *Latera* πλευραὶ, and in our Author, *Lumbi, ſeu Lumbaris regio*. C *Hypogastrium*, the water-course *Aqualiculus*, the lower part of the lower belly, ὑπερον. DD The flanks called *Ilia*, and κενεῶνες. E. The groins called *pubes* or *pecten*, κλοὺς καὶ ἦβη. F F The Lesk called *inguen*, where those tumors which are called *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*, βράχια. L The bowt of the arm, called *Gibber*, ἀγκὼν. M The outside of the lower part of the arm, clled *cubitus*, πῆχυς. N The wrist called *Brachiale*, καρπὸς. O The after-wrist *poſtbrachiale*, μεταβράχιον. P The palm called *Palma*, or *vola manus*. θέναρ. Φ The back of the hand, *dorſum manus*, ὀπισθέναρ. QQ The fore and middle part of the thigh, where we apply cupping-glasses to bring down womens courses, μηρὸς. RR The knee, *genu*, γόνυ. SS The leg, *tibia*, κνήμη. TT The calf of the leg, *ſura*, γαστροκνήμιον. V V The instep, *tarſus*. XX The top of the foot, *Dorſum pedis*, ῥὶς ποδὸς. YY The inner ankles, σφυρὸν. ZZ The outward ankles. α α The toes of the feet. ℭ The place under the inner ankle, where the vein called *Saphena* is opened.

Why the belly is not bony.

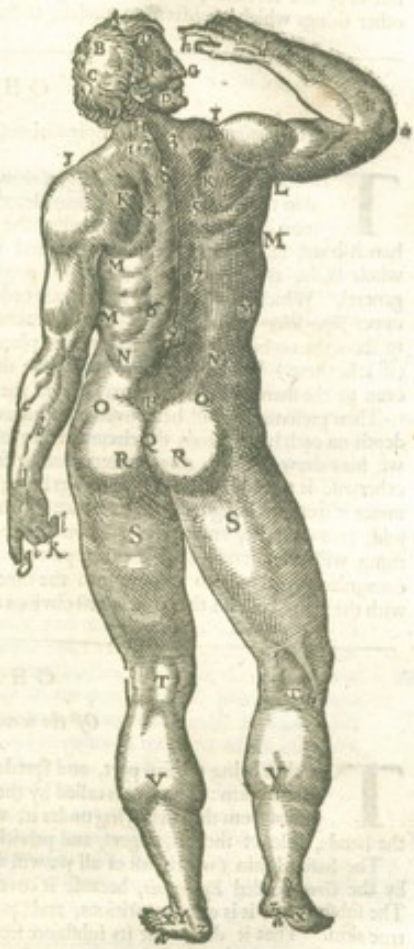
Nature would not have this lower belly bony, because the ventricle might be more easily dilated by meat and drink, children might grow the better, and the body be more flexible. It is convenient we begin our Anatomical Administration from this; because it is more subject to putrefaction than the rest, 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 Anatomical Administrations

must

must be performed in publick, the body being first handsomly 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.

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 general 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 umbilical or middle part; and lastly, into that which is below the navil, called the *Hypogastrium*, or the lower part of the lower belly. The divison of the lower belly.

The Figure of the back-parts of a man.



A The fore-part of the head, *sinciput*, ἔμπροσθεν.
B The top or crown of the head, *vertex*, κόρυφη.
C The hinder part of the head, *occiput*, κοτὶς τῆς ἴνιον.
From D to D the face, *facies*, πρόσωπον.
E The eye-brows, *supercilia*, ὀφρύες.
F The upper eye-lid, βλέφαρον.
G The tip of the nose, called *glabulus nasi*.
H The back-part of the neck called *cervix*, αὐχὴν, 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.
K K The shoulder-blades, *scapulæ*, ὠμοπλάται.
1 2 3 On this place we set Cupping-glasses.
4 5 6 7 The back, *dorsum*, νῶτος.
8 9 The ridge, *spina dorsi*, ῥάχις.
L The arm-hole, *ala*, μασχάλη.
* The elbow, *gibber brachii*.
M M M M the sides, *latera*.
N N The loins, *lumbi*, or the region of the kidneys, ὀσφύς.
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 disease of the right gut.
Q The place of the rump or *Coccyx*.
R R The buttocks, *nates*, πλάσεις.
S S The back part of the thigh, *femur*.
T T The ham, *poples*, ἰσχύς.
V V The calf of the leg, *sura*.
X X The foot, or *parvus pes*, πούς.
Y Y The outer ankle, *malleolus externus*.
Z Z The heel, *calx*, or *calcaneus*, πτέρνα.
a a The sole of the foot, *planta pedis*, πέλμα τοῦ ποδός.
b The inside of the lower part of the arm called *ulna*, ὠλένη.
c The outside of the same, *cubitus*, πῆχυς.
d d the wrist, *carpus*. *e e* The back-part of the hand, *dorsum manus*. *g* The fore-finger, *index*, λοιχανών. *h* The thumb, *pollex*, ἀντίχειρ. *i* The middle-finger, *medius*, μέσος. *k* The ring-finger, *annularis*, *medicus*, ἰατρικός. The little-finger, *auricularis minimus*, σμίκρος.

In every of which three parts there be two lateral or side-parts to be considered, as in the *Epigastrium*, the right and left *Hypocondria*, which are bounded above and below, in the compass of the midriff, and the short-ribs. In the umbilical the two *Lumbares* (some call them *Latera* sides) which, on both sides from the lowest parts of the breast, are drawn to the flanks or haunch-bones; in the *Hypogastrium*, the two *Ilia*, or flanks bounded with the haunch 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 haunch-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 navel, *Lumbares*, and those on the lower parts 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 bowels contained in the belly, which being divers, lie in sundry places; for the greater portion of the liver lies under the right *Hypocondrium*, under the left almost all the ventricle and spleen. Under the *Epigastrium* the lower orifice of the ventricle, and the The *Hypocondria*.

smaller

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 flank, the blind gut; in the middle part thereof the collick and empty guts. In the upper part of the left side lies the Kidney, in the middle part, the rest of the empty and colick guts. Under the region of the navel, 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 kall.

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

If we know, and well understand these things, we shall more easily discern the parts affected 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 the two precedent 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 knowledge of the mentioned parts.

CHAP. II.

Of the containing parts of the Epigastrium, *and the preparation to Anatomical Administration.*

The containing parts of the belly.

THe containing parts of the *Epigastrium*, are the *Epidermis*, or thin outward skin; the true skin; the fleshy or fatty Pannicle, the eighth muscle 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 general. Which that you may see in their order, first you must cut round about the navel, 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 umbilical 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 strait line from the cheft, over the breast-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 a-cross or overthwart, of the like depth on each hand, from the circumference of the navel, 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 divided from the parts lying under it from the designed circumference left about the navel. We must teach how the skin is twofold, 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 lie 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.

From what parts the skin cannot be separated.

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.

The bastard skin (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 spermatical. This outmost 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 Sun-shine.) 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.

The number.

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 Physicians, 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 ornaments to the true skin. This Providence of Nature, the industry of some Artizans, (or rather Curtizans) doth imitate; who, for to seem more beautiful, do smooth and polish it.

The temperature.

The use.

By

By this you may understand, that not all the parts of the body have action, yet have they their use, because, according to *Aristotle*'s 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. Why the Cuticle cannot be restored in scars.

CHAP. IV.

Of the true Skin.

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. The substance. Magnitude.

But for the extent thereof, it encompasses the whole body, if you except the eyes, 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 spermatical, which ariseth from the process of the secundine, which lead the spermatick vessels even to the navel; in which place each of them into 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 and membrane *Chorion*, do argue. For as the *Chorion* is double, without sense, encompassing the whole Infant, lightly fastned 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 three principal 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 external injuries, which encompass us on every side, as the violent and contrary access of the four first qualities. Composure. 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 I formerly mentioned. It hath connexion with the parts lying under it by 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.

It is cold and dry in its proper temper, in respect of its proper flesh and substance, for it is a spermatical 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 qualites, 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 external 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* expel the suliginous excrements, which in Winter, suppresst 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 Pannicle; because in some parts it degenerates into flesh, and becomes musculous, as in a man from the collar-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, 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.

things, by their ſhaking and contracting their backs. Theſe things conſidered, we ſay, the fleſhy
The ſubſtance. Pannicle in its proper body, is of a nervous or membranous ſubſtance, as that which hath its original from the coat *Amnios* (which is next to the Infant) dilated near to the navel, and ſtretched forth for the generation of this Pannicle; in which thing I think good to note, that as the membranes *Chorion* and *Amnios* naturally interwoven with ſmall nervous fibers, encompaſs and inveſt the child as long as it is contained in the womb; ſo the skin and the fleſhy Pannicle, knit together by ſuch like bands, engirt the whole body.

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

Compoſure. The compoſition of it is ſuch, as the ſight of it preſents to our eye, that is, of veins, 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. The temperature thereof is diverſe, according to the variety of the parts interwoven with it.
The uſe. 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 which we formerly touched.

CHAP. VI.

Of the Fat.

The fat is rather an excrement than a part. 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 ſuſtance, bred of the airy and vaporous portion of the blood, which ſweating through the pores of the coats, or mouths of the veſſels,
The ſubſtance. 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
The efficient cauſe of fat. 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 quantity. By which we may underſtand, that the fat is the more or leſs in quantity, according to the diffe-
The compoſure. rent temper of the whole body, and of its particular parts. For its compoſition, it conſiſts of
The ſite, that portion of the blood which we formerly mentioned, intermixt with certain membranes, nervous fibers, veins and arteries. The greateſt part of it lies 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 is always about the nervous bodies, to which it delights to cleave. Moſt Anatomiſts enquire whether the fat lie 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 airy 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 internal heat; like as cold heats in Winter, whereby the bellies are at that time the hotter. I know, ſome learned Phyſicians of our time ſtiffly maintained, that the fat was hot; neither did they acknowledge 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 natural Philoſophers. But we muſt note, (c) that at the joynts 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 white of Eggs, that ſo it might be ſufficient for a longer time to moiſten theſe parts, ſubject to be hurt by drineſs, and to 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 *Sebum*, ſeam, in one thing differing from the ordinary fat, that it is much drier; the moiſter and ſofter portion of the fat being diſſipated by the raging heat of the place. For it is found principally about the (d) 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 dried 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 eyes and heart, ſo that it reſembles the fleſh in denſity and hardneſs; becauſe by the continual motion and ſtrong heat of theſe parts, the thinner portion being diſſipated and diffuſed, the more groſs and terreſtrial remains.

* 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 eight inches, upon the breaſt between four and five inches: which I thought good to remember in this place, both for the rarity of the thing, as alſo becauſe it was increaſed by report, and the place miſtaken; ſome ſaying the *Omentum* or Kall 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 ſeam. (d) In what parts, and for what cauſe the fat is more denſe.

CHAP.

CHAP. VII.

Of the common Coat of the Muſcles.

NExt under the fat, appears a certain coat, ſpread 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 *Periоſteum*, 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 *Periоſteum* (as every membrane which is below the head, takes its original from the *Periоſteum* 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 bind or faſten it ſelf to another part of his own kind to 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 into two, the right and the left diſtinguiſhed by the interpoſition of *Linea Alba*, or White-Line. It is ſituate betwixt the fat and the muſcles; for it is faſtened above and below to theſe parts with fibers, which in ſmalneſs and fineneſs exceed the Spiders web. But by its veſſels, it participates with the three principal parts, and is of a cold and dry temper. The uſe of it is, to contain the muſcles in their natural union, and to keep them, as much as in it lies, 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. Wherefore going about to ſeparate the fat of the *Epigaſtrium* (where you 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 ſubſtance.
The quantity.
The compoſure.
The original.
The number.
The fite.
The uſe.
What the White-line is.

CHAP. VIII.

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

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 continual 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, expel by the tranſverſe, and retain by the oblique. The differences of muſcles, which are many and diverſe, are taken from their ſubſtance, original, inſertion into the part which they move, form or figure, holes or openings, magnitude, colour, ſite, kind 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 Intercoſtal, 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 nourithment; 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 original; ſome ariſe from the bones, as thoſe which move the hands, arms and legs; others from griſſles, 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 original, as, the membrane, which we call the fleſhy Panicle, aſſumes fleſh 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 original from one only bone, as thoſe which bend and extend the cubit; others ariſe of many bones, as the oblique deſcending, the Dorſal, and many muſcles of the neck, which ariſe together from many ſpondyls, and ſides of ſpondyl. There be others, according to the opinion of ſome men, both from the bones and griſſles of the *Pubis* at the right or direct muſcles of the *Epigaſtrium*, yet by their favour I think otherwiſe. Becauſe by the Anatomical and received axiom, A muſcle is there thought to take his beginning, from whence he receives a nerve; but theſe muſcles take a nerve from the intercoſtal muſcles,

What a muſcle is.
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 original.
Where a muſcle hath its original.

Differences of muſcles from their inſertion.

muſcles, wherefore their original ought to be referr'd to the ſides of the breaſt-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, eye-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 eyes; others into ligaments, as the muſcles of the yard. But theſe differences following may be drawn both from their inſertion and original. For ſome muſcles ariſing from many parts, are inſerted into ſome one part, as divers of thoſe 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 original from many bones, and end in griſles of the ſeven ribs, as thoſe two which lie under the *Sternon*. Moreover, alſo theſe differences of muſcles may be drawn from the original 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 temporal muſcles, becauſe they move the temples: Others from their office, as the grinding muſcles; becauſe they move the skin as a Mill, to grind 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 name of *Muſculus* and *Lacertus* are divided. Such are thoſe which bend the wriſt, and which are faſtened to the bone of the leg, and which extend the foot; others are triangular, as that which lifts up the arm, called *Epomis* or *Deltoides*, and that which draws the arm to the breaſt, called the pectoral muſcle. Others quadrangular, as the *Rhomboides*, or Lozenge-muſcle of the ſhoulder-blade, and the two hindſom-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 joyns 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 pyramidical figure, as the ſeventh muſcle of the eye, which compaſſes the optick nerve in beaſts, but not in men; others have a ſemicircular form, as that which ſhuts up the eye, ſeated at the leſſer corner thereof; others reſemble a Monk's cowl, or hood, as the *Trapezius* of the ſhoulder-blade. Beſides, others at their firſt original 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 intercoſtal muſcles and thoſe 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 Intercoſtal, 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 temporal 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 nervy 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 out, and (as it were) ſpred over in a ſtrait 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 ſtrait or acute angle.

Differences of muſcles taken from their figure.

Differences from their perforations.

From their magnitude.

From their colour.

From their ſite.

From their Fibers.

From the ſorts of fibers; for ſome have one kind 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 pectoral 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 or connexion, or their texture of nervous fibers; for ſome have fibers ſomewhat more diſtant and remote immediately at their original, 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, disjoyns 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

huckle-

huckle bone; in some it is nervous and fleshy, as in the internal and external muscle of the arm. Besides, some have one head, others two; as the bender of the elbow, and the external of the leg; others three, as the three-headed 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 unto the tail, as in the intercostal muscles, and those 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 of 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 intercostal, 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 eyes; and besides, some of these have broad and membranous tendons, as the muscles of the eyes, and *Epigrastium*, 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 temporal muscles.

Besides, also others diffuse many tendons from their belly, as in the hands the benders of the fingers, and 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 original, when the nerves and ligaments dispersed through the fleshy substance of a muscle, are by little and little drawn and meet together, until at last carried to the joynt, they are there fastned for the fit bending and extension thereof.

From their action. From the contrariety of their actions; for some parts have contrary muscles, benders and extenders, other have none; for the cods and fundament have only lifters up.

From their function. 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 pectoral muscle, which moves the arm obliquely upward and downward, as the upper and lower fibers are contracted; and also out-right, if all the fibers be contracted together, which also happens to the *Deltoides* and *Trapezius*. I have thought it good to handle particularly 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.

The compound and simple parts of a muscle. HAving declared the nature and differences of a muscle, we must note that some of the parts thereof are compound and universal, 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 original of a muscle, which is one while ligamentous and nervous, otherwhiles also fleshy. By the belly, that portion which is absolutely fleshy: By the tail we understand a tendon consisting partly of a nerve, partly of a ligament promiscuously coming 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 spinal 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 principal 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 external injuries; for, like a fan, it opposeth it self against the heat of the Sun; and is a garment against the cold; and is as a cushion in all falls and bruises; and as a buckler of 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 disjoyned or corrupted by purulent abscesses breaking into the empty or void spaces of the muscles; as we see it happeth in a Gangrene, where the corruption hath invaded this membrane, by the breathing out of the more acid matter or filth.

What use each simple particle hath in a muscle.

CHAP. X.

A more particular inquiſition into each part of a Muſcle.

The nature of a ligament.

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 terreſtrial, dry, hard, cold, white; taking its original immediately, 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 principal 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 humour, ſuch as the brain, the original of all the nerves, and alſo the Spinal 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 kind; but of theſe threds ſome are ſtrait 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 leſſened 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 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 animal parts, to perform voluntary motions; others upon the vital to perform the agitation of the heart and arteries; others upon the natural 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 pure 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 yielding 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 kind is more pallid, even in perfect creatures having blood, ſuch is the fleſh of the heart, ſtomach, weaſon, 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, brains, kidneys, milt: Some add a fourth ſort of fleſh which is ſpongy, and that they ſay is proper to the tongue alone.

The threefold uſe of a ligament.

What a nerve is.

What we mean by the nervous and ligamentous fibers.

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 three 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, inverwoven with tranſverſe fibers; and it doth not only contain blood and ſpirit, but alſo a ſerous humor, which we may believe, 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 perpetual 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 *Anaſtomoſis* 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 joynt and bending of the arm, which I have ſometimes ſhewed in the Phyſick Schools, at ſuch times as I there diſſected Anatomies.

The mutual *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 original, 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.

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 withal in diſſection.

Eight muſcles of the *Epigaſtrium.*

Theſe are eight 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 conjoyned 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 *Pyramidal* 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 muſcle. 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 Fleſhes; their greatneſs is indifferent between the large and the ſmall muſcles; their figure is three ſquare. They are compoſed of the fore-mentioned parts, they are two in number; their ſite is oblique, taking their beginning from the touching of the great ſaw-muſcle, and from the ſixth 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 external 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 infinite labour and trouble to ſet down at large the ſeveral 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 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 original, 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 breaſt-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 rack-bones 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 navel downwards. In their fleſhy part they draw their original from the ſpine of the haunch-bones a little lower than the deſcendant end in their fleſhy part. But for their membranous parts, they ariſe before from the ſhare-bone, but behind 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 navel) 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 and dilate the breaſt; 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 ſtrait fibers.

The oblique deſcendant.

Their ſubſtance.

Their greatneſs and figure.

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 general, (or the ſuperficiary belly;) they are divided by the manifeſt intercourſe of the white-line, even to the navel, in which place they ſeem to be united even to the place of their inſertion. They draw their original 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 unmoveable. 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 *Sternum*, the ſlenderer portions thereof being diſtributed by the way to the *Mediaſtinum*, and about the fourth and fifth rib to the dugs, from whence they take their name.

Their ſite.

Original.

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

That which remains breaking out by the ſides of the breaſt-blade, inſerts it ſelf into thoſe muſcles, creeping along, even almoſt to the navel; 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 Iliack; on each ſide under the ſaid muſcles, until they meet with theſe four mamillary veſſels. That you may find the concourſe of the veins and arteries about the navel, 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, until you ſhall find 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. 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 breaſt downwards, ſo to dilate it. At the end 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.

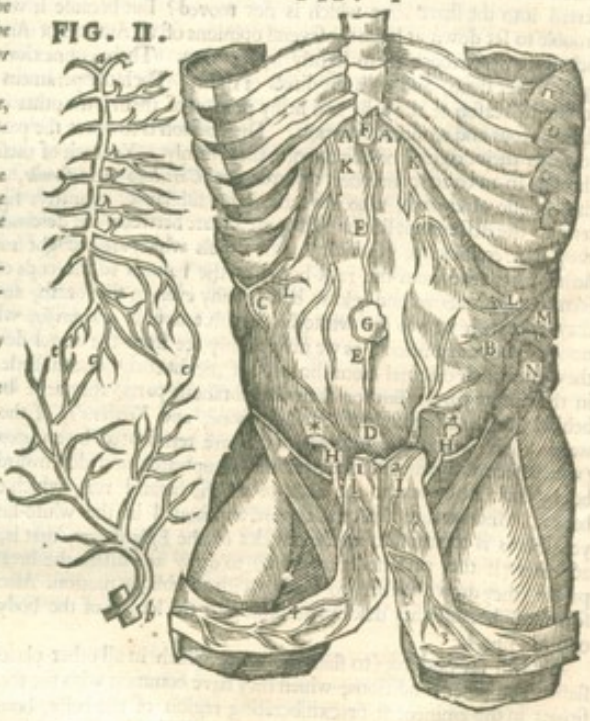
Their action.

Their uſe.

The firſt figure of the lower Belly.

FIG. I

FIG. II.



A B C D *The upper, lower, and lateral 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 breſt-blade.*

G *The navel, which, all the muſcles being taken away, muſt be kept for the demonſtration of the Umbilical veſſels.*

H H *The productions 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 internal mammary, proceeding from under the bone of the breaſt, are carried downward through the right muſcles, and 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* Anaſtomoſis, *or inoculation of the foreſaid veſſels, making the conſent of the* Abdomen *and the noſe, and of the womb with the breaſts, 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 tranſverſe muſcles do grow.*

The Pyramidal or aſſiſting muſcles.

The tranſverſe muſcles of the *Epigaſtrium.*

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 remain to be ſpoken of, ſo called by reaſon of their fibers, which make right angles with the fibers of the right muſcles.

They

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 original 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 figure and ſite.

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

But all the eight recited muſcles, beſide 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 ſtrengthening of the voice, as experience ſhews in thoſe who ſound Trumpets and Cornets. The common uſe and action of the eight muſcles of the *Epigaſtrium*.

Therefore theſe muſcles do equally on every ſide preſs the belly; but the midriff, the intercoſtal 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 upwards to the mouth.

Although to this excretion of the excrements, it is not ſufficient that the Epigaſtrick, Midriff, and intercoſtal muſcles preſs the belly, but the muſcles of the throttle muſt be alſo ſhut. For the mouth being open, the excrements never go well forth; becauſe the vapors do 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 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. Why when the mouth is open, the excrements go more ſlowly forth.

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

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 lies under it, or is placed above it. It is broader above the navel, 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 below the navel, that ſo it may contain the extenſion of the ſtomach, often ſtretched beyond meaſure with meat and drink. On the contrary, women have it ſo thick and ſtrong below their navel, that it ſeems double, that ſo they may more eaſily endure the diſtention of their womb, cauſed by the child contained in it. But above the navel, 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 White-line is. What the *Peritonæum* is. The ſubſtance and quantity.

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 natural parts. The figure.

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 compoſition.

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 number. *Lib. de ſem.*

The later Anatomiſts have obſerved, the coat *Peritonæum* is doubled below the navel, and that by the ſpaces of theſe reduplications the umbilical arteries aſcend to the navel.

It is ſituate near the natural parts, and compaſſes them about, and joyned by the coat, which it gives them, as alſo on the ſides, it is joyned to the *Vertebra*'s of the loins, from whoſe ligaments (or rather *Periſteum*) it takes the original: 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 pluck'd from them but by force, by reaſon of the complication and adheſion of the fibers thereof with the fibers of the proper membrane of theſe muſcles; which membrane in *Galen*'s opinion proceeds from this *Peritonæum*, ſo that it is no marvel that we may more eaſily break than ſeparate theſe two coats. It is of temperature cold and dry, as all other membranes. The ſite and connexion. *Lib. 6. Meth.*

It hath many uſes, the firſt whereof is, to inveſt and cover all the parts of the lower belly, eſpecially 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. Uſe.

Another uſe is, to the further 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 his hands joyned 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 by 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 child, and in tumors againſt nature.

CHAP. XIII.

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 the 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's double.

The compositure.

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.

The connexion.

It is one as we said covering the guts. It 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.

Lib. Anatom. administ.

The temper.

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 two-fold.

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 internal heat. Another use is, that, in want of nourishment in times of great famine, sometimes it cherishes, and (as it were) by it dew preserves the innate heat, both of the ventricle and neighbouring parts, as it is written by *Galen*.

Lib. 4. de usu partium.

Moreover, we must observe, that in a rupture or relaxation of the *Peritonæum*, the Kall falls down into the *Scrotum*, from whence comes that rupture we call *Epiplocele*.

A cause of frustrating conception.

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 fore-mentioned causes.

The second Figure of the lower Belly.

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

B *The upper* B. *sheweth the implantation of Umbilical vein into the liver.*

C *The navel separated from the* Peritonæum. *From* D *to the upper* B *the Umbilical 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* Peritonæum.

* *The Breast-blade.*

H *The bottom of the bladder of urine.*

I *The connexion of the* Peritonæum *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 Umbilical 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. XIV.

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 diverſe, according to the various magnitudes of bodies, and gluttony of men. The figure of it is round and ſomewhat long, like a Bag-pipe. 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 original from the membranes of the brain which accompany the nerves deſcending from the 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 ſixth 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 expel. It draws its original from the *Pericranium*, which aſſoon as it comes to the gullet, takes unto it certain fleſhy fibers. There be nerves ſent into the ſtomach from the ſixth 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 natural parts, aſſoon as it paſſes forth of the midriff.

What the ventricle is. The ſubſtance. The magnitude. The figure. The compoſure. 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 chearfully 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 *Galen*'s 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 it arteries; and with all the natural parts by its common membrane.

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

The temper of the ventricle in men of good habit, is temperate, becauſe it is almoſt compoſed of the equal commixture of ſanguine and ſpermatick parts; or according to *Galen*'s opinion, it is cold of it 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 diverſe 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, until by concoction and elixation, they ſhall be turned into a juyce like cream (which the *Greeks* call *Chylos*;) and laſtly, which doth ſtrongly ſend from it, and repel 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 coarſe and hard meats, as Beef, hard Eggs, and the like, than ſoft meats eaſie of digeſtion, which it corrupts and turns into belchings. For ſo a young Chicken, is ſooner burnt than well roaſted 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 ſower. The action of a well conditioned ſtomach is twofold, one common, another proper. The common is to attenuate, mix 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 enjoys the ſweet pleaſure of the *Chylus*, and comforts it 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 expel 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 near 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 greedineſs; 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 mutual 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 hath beſtowed four faculties on other parts, yet they are not ſenſible of their wants, but are only nouriſhed by the continual ſucking of the veins, as Plants by juyce drawn from the earth.

The two orifices of the ſtomach.

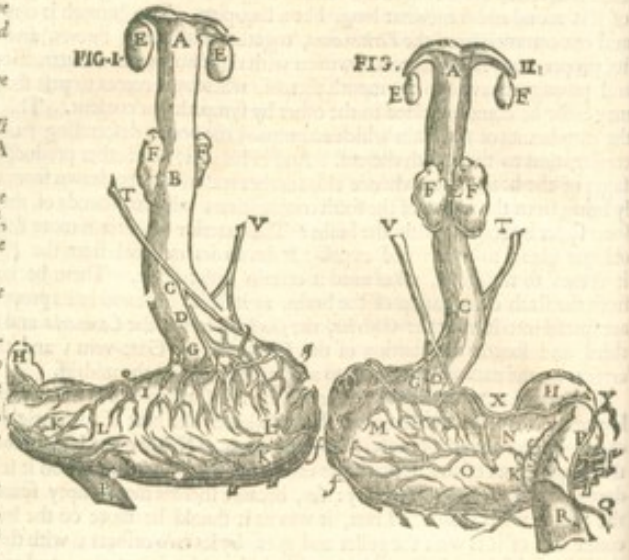
This orifice is ſeated at the fifth *Vertebra* of the cheſt, upon which they ſay it almoſt reſts. Yet I had rather ſay, that it lies upon the twelfth *Vertebra* of the cheſt, and the firſt of the loins; for in this place the gullet perforates the midriff, and makes this upper orifice. The lower orifice 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

The ſite. The glandulous ring of the *Pylorus*.

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 *Pylorus* is glandulous. The stomach in its lower and inner side, hath many folds and wrinkles, which serve to hold and contain the meats, until they be perfectly concocted. In the ventricle, we observe parts gibbous and hollow; the hollow is next to the liver and midriff; 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 navil near the bladder, the which we have observed in some bodies dissected after their death.

The falling down of the stomach.

The third and fourth Figures.



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 strait 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.

E E *the two glandules called the Almonds, set close to the gullet in the end of the throat, called also* Parisimia, Antiades, Tonsillæ, *and* Salviares glandulæ.

F F *another glandulous body in the midst of the gullet, about the fifth rack-bone, from which place the gullet gives place to the great artery, somewhat declining to the right side:* Væsalius, *lib.* 5. *c.* 3. *and* Columbus, *cault. l.* 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 grosse 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 L L *the foreside of the stomach.* P *the gullet 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 E E F F G H P T V *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 back-side 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. XIV.

Of the Guts.

Their substance.

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.

Figure.

Their number.

The figure of the guts is round, hollow and capacious, some more, some less, according to the diverse bigness.

But for the quantity of the guts, some are small, some great, more or less, according to the varieties 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 withal in *Galen's* 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 the artery and nerve which run into it. For seeing that this

The *Duodenum*.

gut

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.

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 neighbourhood of the liver, strongly drawing the *Chylus* contained in it; the third is the flowing down of the Cholerick humor from the bladder of the gall into it, which ever and anon by its acrimony cleanses away the filth, and by continual flowing solicites 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 marvel that there can be no exact demonstration made of them. The fourth is called *Cæcum*, 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 *Peritonæum*, 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 sixth and last, the right-gut, by reason of the rightness or straitness of the passage. This, in Beasts, especially, hath a certain fatness in it to make the passage slippery, and lest the guts should be exulcerated in the passage, by the sharpness of hard and acrid excrements.

The first is called *Duodenum*, or the gut of twelve fingers breadth, because it is commonly twelve fingers long. The second is called *Jejunum*. The third *Ileon*. The fourth *Cæcum*. The fifth *Colon*. The sixth *Rectum*.

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

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 or 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 those 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 joyned together by their coats, because there is but one way from the gullet even to the fundament; but they are joyned to the principal parts by their nerves, veins and arteries.

But a more proper connexion is that, where the *Duodenum* on the upper part of it, is joyned 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 *Ileon*, with the empty blind-guts. The blind with the *Ileon* and *Colon*, and with the right side of the back-bone 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 over-turns and presses the stomach, and so causes vomiting.

Lastly, the right-gut is annexed with the colick-gut and fundament. At the end whereof there is a muscle fastned, 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 door or gate, the excrements are restrained at our will, 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 Palsie, have their excrements go from them against their wills. There is a body situate at the end of the right-gut, and 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 powerful. But there are also certain veins situate about it called the Hæmorrhoidal; of which we will speak in their place.

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.

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

The *Jejunum*.

Ileon.

Cæcum.

Colon.

Rectum.

Their site.

The distinction between the colick and the stone in the kidneys.

Their connexion.

Why vomiting happens in the colick.

The *Sphincter* muscles of the fundament.

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

Levatores Ani.

The action of the guts.

though they be not altogether made for that uſe. But nature is often accuſtomed to abuſe the parts of the body for ſome better uſe.

Their fibers. 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.)

The fifth figure, of the lower Belly.

A *The breaſt-blade,* Cartilago Enſiformis.

BB *The rim, with the midriff and broken ribs bent outwards.*

C C *The gibbous part of the liver.*

D *A ligament tying the liver to the midriff.*

E *Part of the umbilical vein.*

F F *The ſtomach fill'd 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 lieth under the whole bottom 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 cells at* Q R S T. *the leſſer guts eſpecially lying under the navel.*

a a *The two umbilical arteries.*

b *The bottom of the bladder.* * *The connexion of the bladder and the* Peritonæum.

How the guts become fit to retain. But if any ask, how they have retention, being they want oblique fibers; he may know, that the *fæces* 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

Their length. 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 leſt men ſhould be with-drawn by gluttony from action and contemplation. For ſo we ſee it comes to paſs in moſt Beaſts, which have one gut, ſtretched ſtrait out from the ſtomach to the fundament; as in the Lynx, and ſuch other Beaſts of inſatiable gluttony, always, like Plants, regarding their food.

CHAP. XV.

Of the Meſentery.

The ſubſtance. Magnitude. Figure. Compoſure. AFter the guts follows 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 *Peritoneum.* In the midſt thereof, it admits nerves from the Coſtal of the ſixth 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 ſpread 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

Number. name. Yet ſome divide it into two parts, to wit, into the *Meſeræum*, that is, the portion interThe coenexion. woven with the ſmall guts, and into the *Meſo-colon* which is joyned with the great. It hath connexion by its veſſels, with the principal 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 temper. 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

The action and use of it is, to bind and hold together the guts, each in his place, left 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 ways 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. XVI.

Of the Glandules in general, and of the Pancreas, *or Sweet-bread.*

A Glandule is a simple part of the body; sometimes of a spongy and soft substance, sometimes of a dense and hard. Of the soft Glandules are the *Tonsillæ* (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 arm-holes, and others. The number of glandules is uncertain, by reason of the infinite multitude and variety of sporting nature. You shall find them always in those 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 some be seated in such places, as nature thinks needful 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 *scortum*, and at the sides of the womb; or where Nature hath decreed to make emunctories for the principal parts, as behind the ears, under the arm-holes, 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 Physicians say, the blood *recrudescere*, i.e. 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 out spattle useful for the whole mouth, the dugs milk, the testicles seed; others, use only, as those which are made to preserve, under-prop and fill up the divisions of the vessels. Besides this, we have spoken of glandules in general, 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 Bulwark both to it and the divisions thereof, whilst it fills up the empty spaces between the vessels themselves, and so hinders, that they be not pluck'd asunder, nor hurt by any violent motion, as a fall or the like. Connexion. Temper. Action and use. The substance of the *Pancreas*. The site.

CHAP. XVII.

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 *Galen*'s opinion, *lib. de Fœmsætus*) 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 original of the veins; the substance of it is like the concrete mud of the blood, the quantity of it is diverse, not only in bodies of different, but also of the same species; as in men amongst themselves, of whom one will be gluttonous and fearful, and 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 two-fold reason given, why such as are fearful have a larger liver. The first is, because in those the vital 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 supplied by the strength of the natural 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 *Galen*'s 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, 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 always rent with a small division, that the umbilical 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 umbilical vein, as a cushion. What the liver is. The substance and quantity. Why Cowards have great livers.

The

The figure.

The figure of the liver is gibbous; rising up and smooth towards the midriff; towards the stomach is the *sinuus* or hollow side of it somewhat unequal, 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 compo-sure.

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 *Parenchyma*.

The vessels.

Veins and arteries come to it from the navil; 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 number and site.

The coat of the liver is from the *Peritonæum*, waxing small from the umbilical 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 connexion.

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

The temper.

nerve with the brain; and by the same ligatures with all the parts of the whole body. It is of a hot

The action.

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 action of the liver is the conversion 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.

The ligaments.

It is bound and tied 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 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 collar-bone. And thus much may suffice for its proper ligaments, for we before-mentioned its common; the veins, arteries, nerves, and coat of the *Peritonæum*, by which it is knit to the loins and other natural 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 Anatomical observations, and *Hollerius* in his Practice, *c. de Pleurit.*

CHAP. XVIII.

Of the Bladder of the Gall.

The substance greatness and figure thereof.

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.

The composition.

It is composed of a double coat, one proper, consisting of three sorts of fibers, the other from the *Peritonæum*.

Number and connexion.

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 sixth 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 seldom with the stomach also, by another passage; and to conclude, to all the parts by its veins, nerves, arteries, and common coat.

Temper.

It is of a cold temper, as every nervous part is.

Action.

The action of it, is to separate from the liver the cholerick humor, and that excrementitious, but yet natural, by the help of the right fibers, for the purifying of the blood, and by the oblique fibers, so long to keep it being, until it begin to become troublesom 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 channels of the Gall.

The bladder of the gall hath divers channels: 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 carried into the *Duodenum*, unless that in some it send another branch into the bottom 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.*

Lib. 2. de Temper.

The other, coming out of the body of the liver, divides its 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 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.*

QQ *The holes of the bladder of the 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

num. d *The* Duodenum *opened to manifeſt the* Porus Biliaris. i. 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,* g g *The Cyſtick Twins from the Gate-veins.*

CHAP. XIX.

Of the Spleen or Milt.

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 bloud from the Liver) and of a fleſh more black than the Liver. For it reſembles the colour of its muddy bloud, from which it is it is generated. It is of an indifferent greatneſs, but bigger in ſome than in other-ſome, according to the diverſe temper and complexion of men. It hath, as it were, a triangular Figure, gibbous on that part, it flicks to the Ribs and Midriff, 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 *faces* or dregs of bloud, or rather of the natural 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 Coſtal, from the ſixth conjugation on the inner part, by the roots of the ribs; and we may manifeſtly ſee this Nerve, not onely 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 Midriff which deſcends to the roots. For it oft-times cleaves to the Midriff 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 ſecondarily, with all the parts of the Body by theſe its Veſſels.

The Subſtance.

Magnitude Figure.

Compoſition.

Number and Site.

Connexion.

It is of a cold and dry 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 continual motion and native heat, which they carry in full force with them from the Heart, that groſs bloud puts off its groſsneſs, 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 groſsneſs of the melancholy bloud, are a Vein aſcending from it into the Stomach to ſtir up the appetite by its ſoumeſs, 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 Hæmorrhoidal Veins.

Temper and uſe.

CHAP. XX.

Of the Vena Porta *or Gate Vein, and the diſtribution thereof.*

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 onely one, and that ſituate in the ſinous or hollow part of the Liver, from whence it breaks forth (or rather out of the Umbilical 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, until it may carry back the ſame turned into bloud for the nutriment of the Stomach, Spleen, and Guts. This Gate-vein coming out of the ſinous 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 fore-part of the trunk of 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 known by the name of *Cyſticæ Gemellæ*, or Cyſtick Twins. The ſecond called the *Gaſtrica* or Stomach Vein, ariſing in like manner from the forepart of the Trunk, is carried to the *Pylorus* and the ſinous or back part of the Stomach next to it.

The Subſtance and Figure.

Compoſition.

Number and Site.

Temper and Action.

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

1. *Cyſticæ Gemellæ.*

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 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 are the four ſimple Branches. Now we will ſpeak of the compound.

4. *Inteſtinalis.*

The firſt is ſplenick, which is divided after the following manner. For in its firſt beginning and upper part, it ſends forth the *Coronalis*, or Crown-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 down to the lower, ſending forth by the way other branches to the fore and back parts of the Stomach. Theſe engird and on every ſide encompaſs the Body or the Ventricle, for which cauſe they are named the Crown-veins.

Two compound.

I. *Ramus Splenicus*, ſending forth,

1. *Coronalis.*

2. *Hæmorrhoidalis Externa.*

I have sometimes observed this coming 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 Hæmorrhoidal Veins, which descending to the Fundament above the left side of the Loins, 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 Hæmorrhoidal Veins, sometimes more, sometimes less.

3. *Gastrepiploïs major sinistra.*

4. *Epiploïs simplex.*

5. *Vas breve seu Venosum. Lib. 4. de usu Partium.*

Silvius writes that the Hæmorrhoidal branch descends from the Mesenterick: and truly we have sometimes observed it to have been so. Yet it is more suitable to Reason, that it should descend from the Splenick, not onely 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 term it the greater, middle, and left *Gastrepiploïs*. 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.

We have oftentimes and almost always observed, that this Vein-vessel, which *Galen* calls *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 juice can that way be poured, or sent, into the capacity of the Stomach. Now the splenick branch, when it hath produced out of it those five fore-mentioned branches, is wasted and dispersed into the substance and body of the Spleen.

II. *Ramus mesaraicus* divided into three Parts.

Then follows another compound branch of the *Vena Porta*, called the Mesenterick, which is divided into three parts; the first and last 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 the *Ileon*, as the third and greater in the *Jejunum* 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 down, you must not wonder at it, for you shall scarce find it the same in two bodies, by reason of the infinite variety of particular Bodies, which (as the Philosophers say) have each their own, 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.

CHAP. XXI.

Of the Original of the Artery, and the division of the Branch descending to the Natural Parts.

The original of Arteries. The division of the great descendent Artery, is into these;

THese 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 Natural 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 Natural 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 Intercostal, runs amongst the intercostal Muscles, and the distances of the Ribs and Spinal Marrow, through the perforation of the Nerves on the right and left hand from the fifth true, even to the last of the Bastard Ribs.

1. *Arteria intercostalis.*

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

2. *Phrenica.*

The second being parted into two, goes on each side to the Midriff, whence it may be called, or expressed by the name of the *Diaphragmatica*, or *Phrenica*, (*i.*) the Midriff Artery.

3. *Cœliaca.*

The third being of a large proportion, arising from the upper part of the Artery, presently after it hath passed the Midriff, is divided into two notable branches, whereof one goes to the Stomach, Spleen, Kall, to the hollow part of the Liver and the Gall; the other is sent forth to the Mesentery and Guts after the same manner, as we said of the Meseraick Vein, 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 carried to the Reins, where it is named the Reignal or Emulgent, because it sucks fit matter from the whole mass of bloud.

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 whilest we labour to lay it open, that we do not hurt and break it.

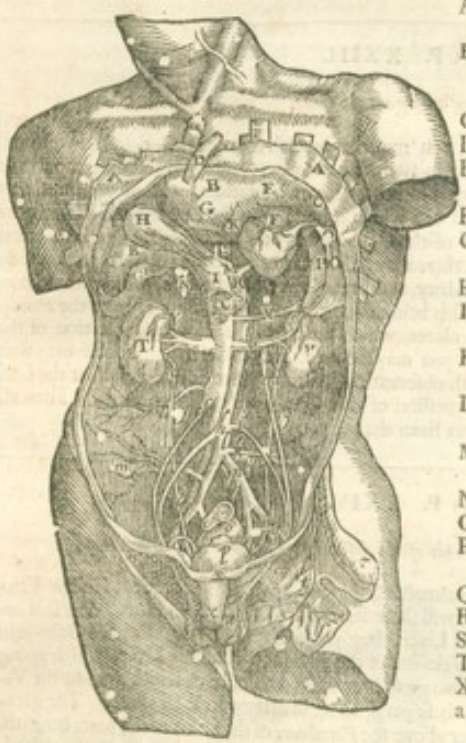
6. *Hæmorrhoidalis seu mesaraica inferior.*

The sixth going from the fore and upper part of this descendent Artery, descends with the Hæmorrhoidal Veins to the Fundament; presently from his beginning, sending forth certain branches alongst the Colick Gut, which by *Anastomosis* are united with other branches of the *Cœliacal* Artery; 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 *Anastomosis* is a communion and a communicating of the Vessels amongst themselves by the application of their mouths, that so by mutual supplies they may ease each others defect. But they call this the lower Meseraick Artery.

The

The seventh proceeding from the trunk with so many branches as there be *Vertebra's* in the loins, goes to the loins, and the parts belonging to them, that is the spinal marrow of that part, and other parts encompassing these *Vertebraes*, whereupon it is stiled the *Lumbaris*, or Loin-Artery. 7. *Lumbaris.*

The Seventh Figure of the lower Belly.



AA *The Midriff turned back with the ribs of 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 Umbilical Vein.*
E *The hollowness of the Liver, which giveth way to the Stomach.*
F *The left orifice of the Stomach.*
GG *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 from the Liver coming from the stomachical nerve.*
L *An Artery common to the Liver and Bladder of Gall.*
M *A nerve common also to them both, coming from the right* costal *nerve of the ribs.*
N *The passage of the Gall the Guts cut off.*
OO *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* Cœliacal *Artery cut off.*
TV *The Kidneys yet wrapped in their membrane.*
XY *The fatty veins called* Venæ adiposæ.
a b *The Emulgent Veins with the Arteries under them.*
cc dd *The Ureter from either kidney to the bladder.*
e f *The Spermatical Veins to the Testicles; the right from the hollow Vein, the left from the Emulgent.*
g g *Veins coming from the Spermatical to the* Peritonæum. h i *The spermatical Arteries.* k *The lower mesenterical 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 Artery 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 f *The* Scrotum *or Cod, that is, the skin that invests the Yard and Testicles.* t *The flothy 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.*

The eighth maketh the Iliack Artery, untill such time as it departs from the *Peritonæum* where the Crural Arteries take their original. This Iliack Artery sends many divarications towards the Holy bone where it takes its beginning, and to the places lying near the Holy bone, which, because they run the same course as the Iliack Veins, for brevities sake we will let pass further mention of them till we come to treat of the Iliack Veins. 8. *Iliaca.*

CHAP. XXII.

Of the distribution of the Nerves to the Natural 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 sixth 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 Midriff, those which are distributed amongst the Natural 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. The Original of the Nerves which are carried to the Natural parts.

These Nerves are but small, because the parts serving for nutrition, needed none but little Nerves for the performance of the third duty of Nerves, which is in the discerning and knowing of what is troublesom to them. For unless they had this sense, there is nothing would hinder, but these bowels, necessary for life, being possessed with some hurtful 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. Their Magnitude and Use.

And besides, if they were destitute of this sense, they might be gnawn, ulcerated, and putrified 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 plucked, presently by the expulsive faculty they endeavour to expel that which is troublesom, and so free themselves of present and future dangers.

CHAP. XXIII.

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 tied in two different places, at a just distance about four fingers from the end, with a sharp knife between two ligatures. Then you must shew its proper Coats and Fibres, and that common one which it hath from the *Peritonæum*. This being done, you must in like manner bind the trunk of the Gate-vein as neer the original as you can; that so all his branches being in like manner tied, there may be no fear of effusion of bloud: you must do the like with the Cœliack Artery at the left Kidney, and in the lower Mesenterick, which descends to the right Gut with Hemorrhoidal Veins. This being done pull away the Guts even to the *Duodenum*, which being in like manner tied 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. XXIV.

The Original and Distribution of the descendent Hollow Vein.

The original of the Hollow Vein. It is divided into two Trunks.

BEcause the rest of the natural parts, do almost all depend upon the descendent Hollow Vein, therefore before we go any further, we will shew its Original 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 and Animal parts, and the extremities of these parts, as we shall shew in their place. The greater, descending from the back part of the Liver above the *Vertebraes* 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 *Peritonæum*. Wherefore there it produces the *Venæ adiposæ*, 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 original; for the right doth oftentimes arise from the right emulgent, because it is higher; but the less comes from the very trunk of the Hollow Vein, because the emulgent on that side is lower; and you shall scarce see it otherwise.

The division of the greater branch of the Hollow Vein.

1. *Adiposæ.*

2. *Emulgent.*

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 humour may without impediment have freer passage. Their original 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 bloud from the cholerick and serous humour, 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 humour would have staid 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 oftentimes 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.

3. *Spermatica.*

The third division is called the Spermatick or Seed Vein, it goes to the Testicles; the original thereof is thus; that the right arises on the fore-part of the trunk 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.

4. *Lumbaris.*

The fourth, because it goes to the Loins, is called *Lumbaris*; which in his original and insertion is wholly like the Artery of the Loins. But there are four *Lumbares* or Loin Veins on each side, that is, one in each of the four spaces of the five *Vertebraes* of the Loins.

5. *Iliacæ*, which are divided into,

3. *Musculosæ.*

2. *Sacræ.*

The fifth division makes the *Iliacæ*, until, passing through the *Peritonæum*, they take the names of Crural Veins: These are first divided into the Musculous, so called, because they go to the oblique ascendent and transverse Muscles, and to the *Peritonæum*. Sometimes they have their original from the end of the Trunk. And the same *Iliacæ* are divided into the *Sacræ*, or Holy; which go the spinal marrow of the Holy bone through those holes, by which the Nerves generated of this marrow, have their passage.

Thirdly,

Thirdly, The *Iliacæ* are divided into the *Hypogastricæ*, so called because they are 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 external Hemorrhoidal, ordained for the purging of such bloud as offends in quantity, as those other, [that is, the inward Hemorrhoidal] which descend from the right Gut from the Gate-vein by the spleenick branch, serves for cleansing 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 Womb and utmost part 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 without the *Epigastrium* by that perforation which is common to the Share and Haunch-bones, which, strengthened by the meeting of the other internal Crural 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. 3 *Hypogastricæ*, which produce the *Hæmorrhoidales externæ.*

Fourthly, The *Iliacæ* produce the *Epigastricæ*, 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 *Peritonæum*. 4 *Epigastricæ.*

Fifthly, These *Iliacæ* produce the *Pudendæ*, or Veins of the Privities; because they go in Women to their Privities, and in men to the Cods; where they enter that fleshy Coat filled with Veins, and going to the skin of the Yard they take their beginning under the *Hypogastricæ*. 5. *Pudendæ.*

CHAP. XXV.

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 despoil 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.

The Nineth and Tenth Figure of the Vessels of Seed and Urine.

FIG. II.

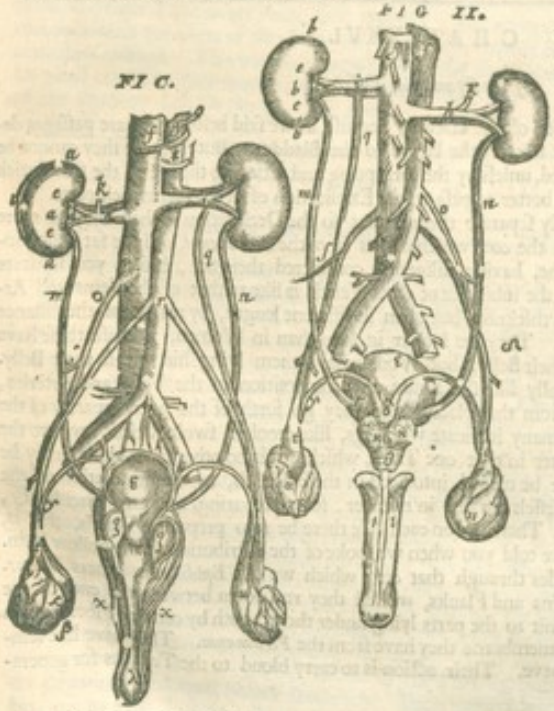


FIG.

The first Figure sheweth the fore-side, the second the hinder-side.

a a a 1 *The fore-part 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 wherein to 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 Cœliacal artery.*

m n 1 2 *The Ureters.*

o p q 1 2 *The right spermatick vein which ariseth near* p, *the left near* q.

r 1 *The place where the arteries of the seed arise.*

s 1 2 *Small branches distributed from the spermatical veins to the* Peritonæum.

t 1 2 *The spiry varicous body, called* Varicosum Vas pyramidale.

u 1 2 *The* Parastatæ *or* Epididymis.

x 1 *The Testicle yet covered with its coat.*

y 1 2 *The place where the leading vessel called* vas deferens, *doth arise.* α 1 2 *The descent of the same leading vessel.* β 1 2 *The revolution of the same leading vessel.* γ 1 2 *The passage of the same vessel 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.* ζ ζ 1 *The small bladder of the seed opened.* η η 2 *The Glandules called* Glandulæ Prostatæ. θ 1 *The Sphincter muscle of the Bladder.* ι ι 1 2 *The two bodies which make the substance of the Yard.* κ κ 1 *The vessels which go unto the Yard and neck of the Bladder.* λ 1 *The passage which is common to the Urine and Seed, cut open.* Ψ 2 *The implantation of the Ureters into the Bladder.*

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 Their Substance.

Magnitude. Figure. 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 bloud about the proper Veſſels, (as happens alſo in other entrails) generates a ſmall Nerve, which ſpringing from the Coſtal of the ſixth Conjugation, is diffuſed to each Kidney on his ſide into the coat of the Kidney it ſelf, although others think it always accompanies the Vein and Artery.

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

Number. Site. 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 lie upon the loins 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 always the higher, for thoſe reaſons I gave, ſpeaking of the original of the emulgent Veſſels. *Columbus* ſeems to think the contrary; but ſuch like controverſies may be quickly decided by the Eye.

Connexion. They have connexion with the principal Veſſels by the Veins, Nerves, and Arteries; by the Coats with the Loins and other parts of the lower Belly, but eſpecially with the Bladder by the Ureters.

Temper. Action. They are of a hot and moiſt temper, as all fleſhy parts are. Their action is to cleanſe the Maſs of the Bloud from the greater part of the ſerous and cholerick humour. I ſaid the greater part, becauſe it is needful that ſome portion thereof ſhould go with the alimentary bloud to the ſolid parts, to ſerve in ſtead of a vehicle, leſt otherwiſe it ſhould be too thick.

Their Strainer. Beſides, you muſt note, that in each Kidney there is a cavity bounded by a certain membrane, encompaſſed 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 cholagogus* through the body of the Liver.

CHAP. XXVI.

Of the Spermatick Veſſels.

Ureters. 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, unleſs 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.

Their Subſtance. Then you ſhall teach that the ſubſtance of theſe Veſſels is like to that of the Veins and Arteries.

Quantity. Their quantity is ſmall in thickneſs, but of an indifferent length, by reaſon of the diſtance of their original 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.

Figure and Compoſure. Their figure and compoſure is wholly like the figure and compoſition of the Veins and Arteries, except in this one thing, that from that place where they go forth of the great capacity of the *Peritonæum*, they are turned into many intricate windings, like crooked ſwoln Veins, even to the Teſticle; That the ſpermatick matter in that one Tract, which yet is no other than bloud, may be prepared to concoction, or rather be turned into Seed in theſe Veſſels, by the irradiation of the faculty of the Teſticles.

Number. Theſe Veſſels are ſix in number, four 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 hollow Vein.

Site. They are inſerted into the Teſticles through that coat which we call *Epididymis*, others *Dartos*. Their ſite is oblique above the Loins and Flanks, whileſt they run down between the ends of the Share and Haunch-bone, they are knit to the parts lying under them, both by certain Fibers which they ſend from them, as alſo by the membrane they have from the *Peritonæum*. They have like temperature as the Veins and Arteries have. Their action is to carry bloud to the Teſticles for generating of Seed.

CHAP. XXVII.

Of the Teſticles, or Stones.

Their Subſtance. Magnitude and Figure. Compoſition. 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 equal, and reſemble a ſmall Pullets Egg 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 ſixth Conjugation, by the roots of the Ribs, and out of the Holy-bone. They are wrapped in four Coats, two whereof are common, and two proper. The common, are the *Scrotum* or

skin

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 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 original of the membrane of the spermatick preparing Vessels. The flesh of the Testicles, is as it were, a certain 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 strikes 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 smalness. The two forementioned common Coats, adhere or stick together by the Vessels not onely 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 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 Kidneys, for some have but one Kidney. They lie hid in the *Scrotum* at the very roots of the Share-bone, connexed to the principal 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 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 action of the Testicle is to generate Seed, to corroborate all the parts of the Body, and by a certain manly irradiation to breed or increase 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.*

The Coat *Erythroïs*.

The *Epididymis*, or *Dartos*.

The Cremaster muscles.

Temper.

Action.

CHAP. XXVIII.

Of the Varicous Bodies or Parastates, *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 do 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*, *l.* 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 be most perfectly laboured and concocted in these Vessels by the power and force of the Testicles. For in the first windings the bloud looks 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 in the Guts, the wrinkles in the bottom of the Stomach, the straitness 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 sharpness. 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 be 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 ways. 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 be perforated by any manifest passage, 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 fibres, even to the inner capacity

Their Substance.

Here the Author speaks otherwise than *Galen*.

Their Action.

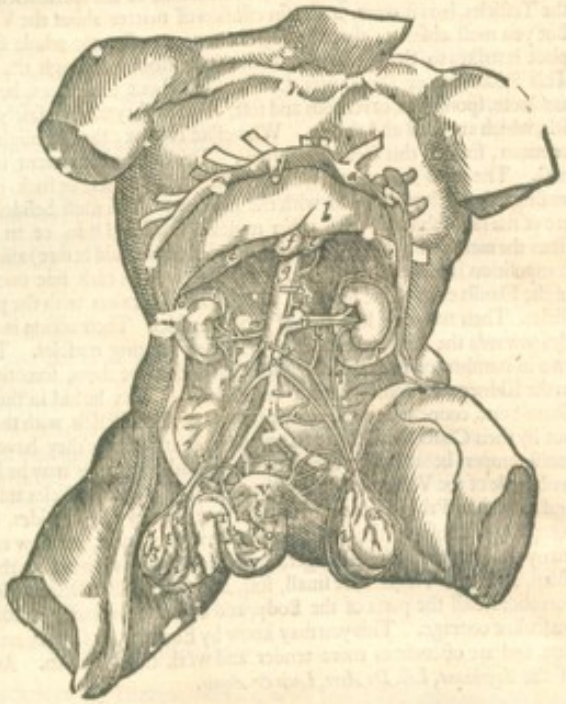
Their Quantity, Figure and Composure.

Their temper and number.

Vasa ejaculatoria, the ejaculatory or leading Vessels.

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.



a a *A part of the Midriff, 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 above the hollow vein, and the diviſion thereof.*
k *The* Cœliacal *Artery.*
m n *The emulgent Veſſels.*
oo pp *The fat tunicles or coats torn from both the Kidneys.*
qq *The Ureters that go unto the Bladder.*
t u *The right ſtermatical Vein which ariſeth near to* u.
x y *The double original of the left ſtermatical Vein.*
x *From the Emulgent.*
y *From the hollow vein.*
α *The original of the ſtermatical Arteries.*
ſs *Certain branches from the ſtermatick Arteries which run unto the* Peritonæum. γ *The paſſage of the ſtermatical Veſſels through the productions of the* Peritonæum, *which muſt be obſerved by ſuch as uſe to cut for the Rupture.* δ *The fiery hidden Hidie's entrance into the teſticle, it is called* Corpus varicoſum pyramidale. ε *The* Paraſtatæ. ζ *The Stone or Teſticle covered with his inmoſt coat.* η *The deſcendent of the leading Veſſel called* Vas deferens. V V *The Bladder.* * *The right Gut.* ξ *The Glandules, called* Proſtatæ, *into which the leading Veſſels are inſerted.* ρ *The muſcle of the Bladder.* σ τ υ *Two bodies of the Yard,* σ *and* τ *and* υ *his Veſſels.* Φ χ *The coat of the Teſticle* ϕ ω *The muſcle of the Teſticle* ϕ, *his Veſſels* ω.

For thus of three paſſages, that is of the two leading Veſſels, and one 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 unnatural Caruncle, then eſpecially when it is ſwollen 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 Proſtates, and 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 glandulous Bodies be ſo obvious to ſenſe or no: We anſwer, it is not manifeſt, though reaſon compel us to confeſs that that way is perforated by reaſon of the ſpermatick, groſs, and viſcous matter carried that way. But peradventure the reaſon why that paſſage cannot be ſeen, is, becauſe in a dead carkaſs all ſmall paſſages are cloſed and hid, the heat and ſpirits being gone; and the great appear much leſs, by reaſon all the perforations fade, 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 point of a needle. Wherefore we need not fear, leſt in ſearching, whileſt 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 Spathem; 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 bloud, 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.

Their Number and Action.

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, and 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 tied to the ſame, to the leading

The *Proſtatæ*. Their quantity and figure.

Number and ſite.

Veſſels

Veſſels, and the parts annexed to them. But always obſerve, that every part which enjoys nouriſhment, life, and ſenſe, either firſt or laſt, hath connexion with the principal parts of the Body, by the intercourſe of the Veſſels which they receive from thence. An Anatomical Axiom.

The uſe of the Proſtates is to receive in their proper body the ſeed laboured in the Teſticles, and to contain it there, until it be troubleſom either in quantity or quality, or both. Beſides, they contain a certain oily and viſcid humour in their glandulous body, that continually diſtilling into the paſſage of the Urine, it may preſerve it from the acrimony and ſharpneſs thereof. But we have obſerved alſo on each ſide other Glandules, which *Rondeletius* calls *Appendices Glandulosæ*, glandulous dependences to ariſe from theſe Proſtates, in which alſo there is ſeed reſerved. Their uſes. *Rond. in method. ad morbos.*

CHAP. XXIX.

Of the Ureters.

NOw it ſeems fit to ſpeak of the Ureters, Bladder, and parts belonging to the Bladder. Therefore the Ureters are of a ſpermatick, white, denſe, and ſolid ſubſtance, of an indifferent bigneſs in length and thickneſs. Their Figure is round and hollow. They are compoſed of two Coats, one proper conſiſting of right and tranſverſe Fibres 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 Kidnies (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 near the orifice of the Bladder, and penetrate into the inner ſpace thereof; for within they do, 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 humour which is fallen into the capacity of the Bladder, cannot be forced or driven back; no not ſo much as the Air blown into it can come this way out, as we ſee in Swines Bladders blown up and filled with Air. Number and Site.

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

For as this Skin or Coat turned in by the force of the humour 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 ſtupifie 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. XXX.

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 leſs, according to the difference of Age and habit of body. It is of a round Figure, and as it were, Pyramidal. Figure.

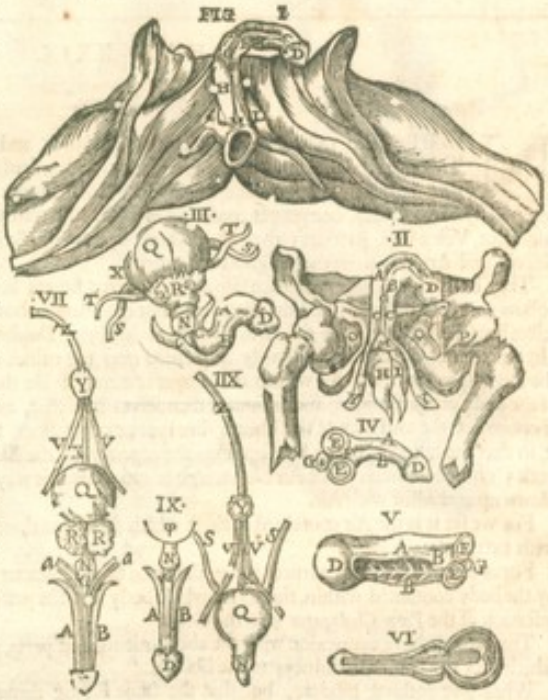
It is compoſed of two Coats, one proper, which is very thick and ſtrong, compoſed of the three ſorts of Fibres, that is, in the inner ſide of the direct, without of the tranſverſe, and in the midſt of the oblique. The other common Coat coming from the *Peritonæum*, hath Veins and Arteries on each ſide one, from the *Hypogaſtrick* Veſſels above the Holy bone; alſo it hath Nerves on each ſide from the ſixth conjugation mixt with the Nerves of the Holy bone. For theſe Nerves deſcend from the Brain even to the end of the Holy bone. Compoſition.

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 his 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.

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 expel it by the neck, partly by compreſſion either of it ſelf, or rather to the muſcles of the *Epigaſtrium* and Midriff; 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 fills, is dilated; but as it is emptied, 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 in Women; but in Men it is terminated in the *Peritonæum* as ſoon as it hath left the right Gut. Beſides, this muſcle is thus far ſtretched Temper, uſe or action. The ſphincter of the Bladder.

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 *Proſtates*, and that it is nothing elſe but the beginning of the neck of the Bladder, which becomes more fleſhy whileſt it is woven with tranſverſe fibers.

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 mutual 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.*
HI 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 original.*
KL 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 Umbilical Arteries.* X 7 8 *The Ligament of the Bladder called* Urachus. Y 7 8 *The Navel or Umbilicus.* Z 7 8 *The Umbilical Vein.* aa 7 *The Vein and Artery of the Yard.* b 5 *The Artery diſtributed through the body of the Yard.*

The neck of the Bladder.

For the neck of the Bladder: it differs nothing in ſubſtance, compoſure, number, and temper from the Bladder, but onely 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 *Peritonæum*, 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 connexion and uſe thereof.

In men it hath connexion with the Bladder, the ejaculatory Veſſels, the right Gut and Yard, but in Women onely with the neck of the Womb and Privities. The uſe of it is in Men to caſt forth Seed and Urine, in Women onely Urine. But we muſt note that the Share-bones muſt be divided and pulled aſunder in that part where they are joined, that ſo you may the more exactly obſerve the ſituation of theſe parts. Beſides you muſt note, that by the *Peritonæum*, we underſtand nothing elſe, in Men and Women, than that ſpace which is from the Fundament to the Privities, in which the ſeam is called *Taurus*.

CHAP. XXXI.

Of the Yard.

The ſubſtance, quantity and figure 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 original 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.

Compoſure.

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

the Veins and Arteries from thoſe 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.

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 ſpongy 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 the original, and then grows leſs again. The two other lower ariſe from the Muſcles of the Fundament, and accompany the Urinary paſſage the length of the *Peritonæum* until 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 ſtiff 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 ſtiff 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 the 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 bloud. But all theſe ſtirred up by the delight of deſired pleaſure, and provoked with a venereal fire, ſwell up and erect the Yard. The Nut. The *Præputium*, or Foreskin.

CHAP. XXXII.

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, Original, 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.

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 Veſſels, a little before they come to the Teſticles, are divided into two unequal 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 Womb between the proper Coat and the common, from the *Peritonæum*, 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. Why Womens ſpermatick Veſſels are larger, but ſhorter then Mens.

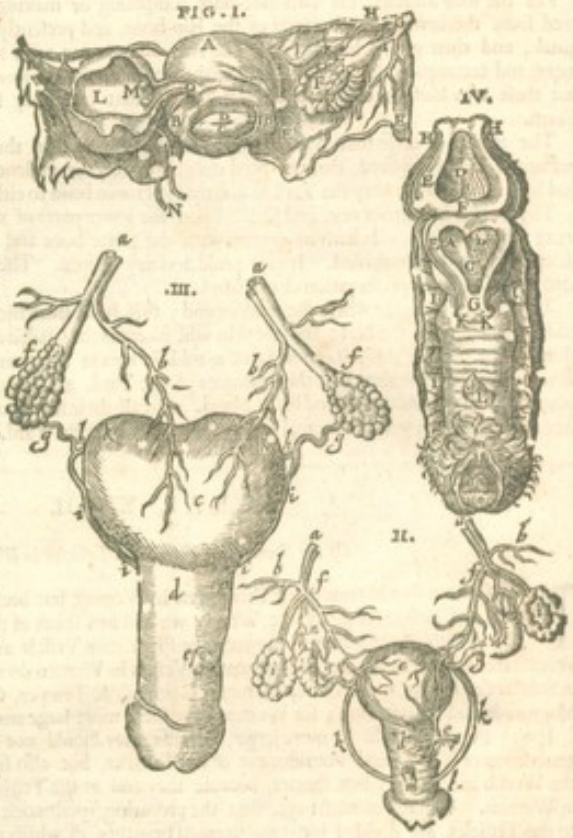
For their Teſticles, they differ little from Mens but in quantity; for they are leſſer, and in Figure more hollow and flat, by reaſon of their defective heat which could not elevate or lift them up to their juſt magnitude. Their compoſure is more ſimple; for they want the *Scrotum* or Cod, the fleſhy Coat, and alſo, according to the opinion of ſome, the *Erythroides*; but in place thereof they have another from the *Peritonæum* which covers the proper Coat, that is, the *Epididymis* or *Dartos*. *Silvius* writes, that Womens Teſticles want the *Erythroides*; yet it is certain, that beſides their peculiar Coat *Dartos*, they have another from the *Peritonæum*, which is the *Erythroides*, or, as *Fallopius* calls it the *Elythroides*, that is as much as the *Vaginalis*, or ſheath. But I think that this hath ſprung from the miſunderſtanding that 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 Paraſtates (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 *Peritonæum*; Women have them lying hid in their belly, near the bottom at the ſides of the Womb, but yet ſo as they touch not the body of the Womb. In what their Teſticles differ from Mens. *Lib. 14. de uſu Partium.* Site.

But theſe Teſticles are tied to the Womb, both by a Coat from the *Peritonæum*, as alſo by the leading Veſſels deſcending to the Horns of the Womb; but to the reſt of the body, by the Veſſels and the Nerves ariſing from the Holy-bone and Coſtal 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 *Peritonæum*, then preſently they become nervous, and wax ſo ſlender, that they may ſeem broken or torn, though it be not ſo; but when they come nearer to the Horns of the Womb, they are again dilated; in their own 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 believe that theſe windings might ſupply the defect of the Varicous Paraſtates. They Connexion. Temper. Their ejaculatory Veſſels. Why they have more intricate windings.

are

Their Site. are seated between the Testicles and Womb; for they proceed out of the head of the Testicle, then presently, armed with a Coat from the *Peritonæum*, they are implanted into the Womb by its horns.

The Twelfth Figure of the Womb.



The First Figure.

A *The bottom 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, *and holding together the Vessels thereof.*

F *The left Testicle.*

G *The spermatical Vein and Artery.*

H *A part of the spermatical Vessels reaching unto the bottom of the Womb.*

I *One part of the Vessels coming to the Testicles.*

* *A Vessel 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.

a a *The spermatical Vein and Artery.* b b *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.* f f *Vessels reaching to the bottom of the Womb produced from the spermatical Vessel.* g g *The leading Vessel of the Seed called* Tuba, *the Trumpet.* h h *A branch of the spermatical Vessel compassing the Trumpet.* i i *The Testicles.* k k *The lower ligaments of the Womb, which some call the Cremasters or hanging Muscles of the Womb.* l *The Lap or Privity in which the Cremasters do end.* m *A portion of the neck of the Bladder.*

The Third Figure.

a a *The spermatical Vessels.* b b *A branch from these spermatical Vessels to the bottom of the Womb.* c *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.* f f *The Testicles.* g g *The leading Vessels, commonly (though not so well) called the Ejaculatory Vessels.* h h *The division of these Vessels, one of them determining into the horns at double* k k. i i *The other branch ending in the neck, by which Women with child avoid their seed.* k k *The Horns of the Womb.*

The Fourth Figure.

AB *The bosom of the bottom of the Womb, at whose sides are the Horns.* CD *A line like a suture or seam, a little distinguishing that bosom.* E E *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.* K K *The beginning of the neck of the Womb.* L *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.*

CHAP.

CHAP. XXIII.

Of the Womb.

THe Womb is a part proper onely 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 onely 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 Womb is but ſmall in one of unripe Age, having not uſed Venery, nor which is Menſtruous; therefore the quantity cannot be rightly defined. The ſubſtance and magnitude of the Womb.

The figure of the Womb 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 Womb. Compoſure. The Veins and Arteries.

Firſt, Theſe Veſſels before they aſcend on each ſide to the Womb, divide themſelves into two branches, from which otherſome go to the lower part of the Womb, otherſome to the neck thereof, by which the menſtruous bloud, if it abound from the Conception, may be purged.

Nerves come on both ſides to the Womb, both from the ſixth Conjugation, deſcending by the length of the back-bone, as alſo from the holy bone, which preſently united and joined together, aſcend and are diſtributed through the Womb, like the Veins and Arteries. Nerves.

The utmoſt or common Coat of the Womb proceeds from the *Peritonæum*, on that 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 expel, if occaſion be; the oblique in the midſt, for the due retention thereof. The Coats.

The Womb 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 Cells in the Womb. 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 nourihment for them. No Cells in the Womb.

Nature hath placed the Womb at the bottom of the Belly, becauſe that place ſeems moſt fit to receive the 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 tied 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 ſite.

By reaſon of this ſtrait connexion, a Woman with child feeling the painful drawings back, and as it were, convulſions of thoſe ligaments, knows her ſelf with child. It 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, until the time appointed by Nature; and alſo beſides, to receive and evacuate the menſtruous bloud. The compound parts of the Womb are the proper Body and Neck thereof. That Body is extended in Women big with child, even to the Navel, in ſome higher, in ſome lower. The temper and action.

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 menſtrual 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 haſel nuts: but then alſo they ſwell up in Women, and are like a rude piece of fleſh of a finger and a half thick, which begirt all the natural parts of the Infant ſhut up in the Womb; out of which reſpect this ſhapeleſs 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 umbilical Veſſels proceed, ſo in Women this fleſhy lump is woven with Veins and Arteries, whence ſuch Veſſels have their original. Which thing, how true and agreeable to reaſon it is, let other men judge. The *cotyledones*. *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 onely ſaid to be the dependents thereof; ſo in Women ſuch ſwollen *Cotyledones* merit not the name of *Chorion*, but rather of the dependences thereof.

This Body ends in a certain ſtraitneſs which is met withall, in following it towards the Privities, in Women which have born 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 Womb, which is moſt exactly ſhut after conception, eſpecially until the Membrane, or Coats encompaſſing the Child be finiſhed 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 humours which are heaped up in the Womb in the time of their being with Child The orifice of the Womb. The proper orifice of the Womb is not always exactly ſhut, in Women with Child.

The neck of the Womb.

From this orifice the neck of the Womb taking its original, is extended even to the Privities. It is of a musculous substance, composed of soft flesh, because it might be extended and contracted, wrinkled, 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 diverse, by reason of the infinite variety of bodies. The figure of it is long, round, and hollow. The composition is the same with the Womb, but it receives not so many Vessels as the Womb; for it hath none but those which are sent from the *Hypogastrick* Veins by the branches ascending to the Womb. This neck on the inside is wrinkled with many cresis, 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 onely one, and that situate between the neck of the bladder and the right Gut, to which it closely sticketh, as to the Womb 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.

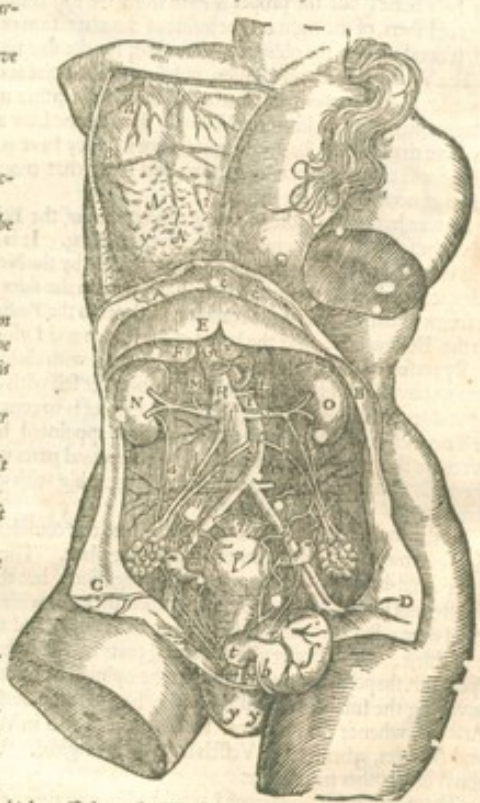
Temper.

It is of a cold and dry temper, and the way to admit the seed into the Womb, to exclude the Infant out of the Womb, as also the menstrual evacuation. But it is worth observation, that in

No *Hymen*.

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*, *Fallopius*, *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 errour through this occasion, because that in some a good quantity of bloud breaks forth of these places at the first copulation.

The thirteenth Figure, shewing the parts of Women different from those 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* Cœliacal *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.*

a a *The right Ureter at the lowest* a, *cut from apart which, near to* b, *sticketh yet to the bladder, because the bottom of the bladder is drawn to the left side.*

c *The left Ureter inserted into the Bladder near to* r.

d d *The Spermatick Vein which goeth to the left testicle marked with* i.

e e *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.*

g h *The spermatical Arteries.*

i i *The two testicles.*

l l *A branch which from the spermatick Vessels reacheth unto the bottom of the Womb.*

m m *The leading Vessel of the Seed which* Fallopius *calleth the* Tuba *or trumpet, because it is crooked and reflected.*

n *A branch of the spermatick Vessel compassing the leading Vessel.* o o *A Vessel like a Worm which passeth to the Womb, some call it* Cremaster. p *The bottom of the Womb, called* Fundus Uteri. q *A part of the right Gut.* r s *The bottom of the Bladder whereto is inserted the left Ureter, and a Vein led from the neck of the Womb near 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 Womb above the Privity.* y y *Certain skinny Caruncles of the Privities, in the midst of which is the slit, and on both sides appear little billocks.*

The Figures belonging to the Dugs and Brests.

α α *The Veins of the Dugs which come from those, which descending from the top of the shoulder, are offered to the Skin.* β *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 Brest.* δ δ *The Kernels and fat between them.* ε ε *The Vessels of the Dugs descending from the lower part of the neck called* Jugulum, *under the Brest-bone.*

From

But it is more probable that this happens by the violent attrition of certain Veſſels lying in the inward *ſuperficies* of the neck of the Womb, not being able to endure without breaking ſo great extenſion as that nervous neck undergoes at the firſt coition. For a Maid which is marriageable, and hath her genital parts proportionable in quantity and bigneſs to a Mans, ſhall find no ſuch effuſion of bloud, 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.

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 Womb, 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 *Peritonæum*. It hath connexion with the Fundament, the neck of the Womb 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 Womb may be in danger to take cold. The lips of the Privities called by the *Greeks* Πτερυγόμαλα, by the *Latines Alæ*, contain all that region which is inveſted with hairs; and becauſe we have fallen 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 bloud may follow, that it might cauſe either death to the Woman, or barrenneſs of the Womb, by reaſon of the refrigeration by the too great effuſion of bloud. The later Anatomiſts, as *Columbus* and *Fallopius*, 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 joins together thoſe Wings we formerly mentioned. *Columbus* calls it *Tentigo*; *Fallopius 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.* Πτερυγόμαλα. *Cleitoris, Tentigo.*

CHAP. XXXV.

Of the Coats containing the Infant in the Womb, and of the Navel.

THe Membranes or Coats containing the Infant in the Womb 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 ſhall 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 Womb. 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 Womb by the *Cotyledones*, which have the ſame office, as long as the Child is contained in the Womb, as the Nipples or Paps of the Nurſes after it is born. For thus the Womb brings the *Cotyledones*, or Veins degenerating into them through the Coats like certain Paps to the Infant ſhut up in them.

Theſe Coats are three in number, according to *Galen*; one called the *Chorion*, Secundine, or After-birth; 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 skilful 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, eighth, or in the full time, being the nineth Moneth, although I fought it with all poſſible diligence, the Midwives being ſet apart, which might have violated ſome of the Coats. The number.

But thus I went about this buſineſs: I divided the dead body of the Mother croſswiſe upon the region of the Womb, and taking away all impediments which might either hinder, or obſcure our diligence, with as much dexterity as was poſſible, we did not onely draw away that Receptacle or Den of the Infant from the inward ſurface of the Womb, 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 and tearing; for thus we poured forth no moiſture, whereby it might be ſaid, that any Coat made for the containing of that humour, 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 humours, 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 holding the apertion, that no moiſture might flow out of it into the circumference of the *Chorion*, or Womb, then preſently 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 humour contained in any other Coat beſides. But having done this with ſingular diligence and fidelity, we could ſee no other humour, nor no other ſeparation of the Membranes beſides.

He shews by three several reasons that there is no *Allantoides*.

So that from that time I have confidently held this opinion, that the Infant in the Womb is onely 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 quill 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 Navel 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 find, nor see, in the Navel, that passage called the *Urachus*, which they affirm to be the beginning and original of the Coat *Allantoides*. But if it be granted that there is no such Coat as the *Allantoides*, what discommodity will 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 there be any, it is tempered by the admixture of the gentle vapour of Sweat.

Besides, If you consider or have regard to the use of such an humour (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 find no humour 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 onely 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.

Fallopius in some sort seems to be of this opinion; for he onely 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 tied 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 umbilical 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 humours, which the Child 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. XXXV.

Of the Navel.

What the Navel is.

The Navel is the center of the body.

The Figure and Composure.

Lib. de format. fœtus in utero.

There is onely one Vein in a Childs Navel, but no *Urachus*

THe Navel 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 onely swelling in certain places, resembling a knot, onely lifted up on one side; it arises and takes its original 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 Navel. 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 Navel, penetrates from thence into the hollow part of the Liver, where divided into two, according to *Galen*'s opinion, it makes the Gate and Hollow Veins. But the Arteries carried by themselves the length of the Navel, cast themselves into the *Iliacæ*, which they make, as also all other, that from thence the Vital 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 Navel, they may seem to make the Infants external Skin and fleshy Pannicle. I know very many reckon two umbilical 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 onely 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 will willingly confess that to his credit, from whom I have reaped such benefit.

The other things that may be required concerning the Navel, 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 Navel 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 honour and glory for ever and ever. *Amen.*

The End of the Third Book.

BOOK IV.

Treating of the Vital parts contained in the CHEST.

The PREFACE.

Having finished the first Book of our Anatomy, in explanation of the Natural 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 original of thoſe Veſſels which are diſperſed through them. To this purpoſe we will define what the Cheſt *is, and then we will 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 Collar bones, below with the Midriff, before with the *Sternon* or Breſt, behind with the twelve *Vertebraes* of the Back, on both ſides, with the true and Baſtard Ribs, and with the intercoſtal and intercartilagineous Muſcles. Nature hath given it this ſtructure and compoſition, leſt that being a defence for the Vital parts againſt external injuries, it ſhould hinder reſpiration; which is no leſs needful for the preſervation of the native heat diffuſed by the vital ſpirits, and ſhut up in the Heart, as in the Fountain thereof, againſt internal injuries, than the other forementioned parts againſt the external. 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 collar-bones contain the upper, the Midriff the lower, and the *Sternon* the middle. The *Sternon* in *Galen*'s opinion is compoſed of ſeven bones, I believe 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 will 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 Pomegranate, becauſe it reſembles that fruit; others call it *Cartilago ſcutiformis*, that is, the Breſt-blade.

Cartilago ſcutiformis, the Breſt-blade.

It is placed there, to be (as it were) a Bulwark or defence to the mouth of the Stomach, endued with moſt exquiſite 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 ſometime falls 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 oftimes it may be ſo moiſtned 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 Medicins 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 terreſtrial, cold, dry, hard, weighty, and without ſenſe, differing from a Bone in drineſs onely, 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 onely 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 Eye-lids called *Tarſi*, of the *Epiglottis*, and Throttle. 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 Collar-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 onely yield 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 external injuries, by breaking violent aſſaults, by ſomewhat yielding to their impreſſion, no otherwiſe than ſoft things oppoſed againſt Cannon-ſhot. We will 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 fore-mentioned 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 fore-mentioned 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 ſtraight line from the upper part of the lower Belly, even to the Chin; then draw another ſtraight line, overthwart at the Collar-bones even to the Shoulder-blades; and in the places between the Collar-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 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 onely 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.

Their ſubſtance.

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.

Magnitude. Figure. Compoſure.

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 Pyramidal, 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.

And there they are divided into infinite Rivulets by the interpoſition of the Glandules and Fat, by which fit matter may be brought to be changed into the Milk by the faculty of the Dugs.

Which Glandules have Nerves, and which have none.

We will ſpeak no more of the Nature of the Glandules or Kernels, as having treated of them before; onely 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 intercoſtal, by which it comes to paſs, that they have moſt exquiſite ſenſe. Others want a nerve, as thoſe which ſerve only for diviſion of the veſſels, and which have no action, but only uſe.

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

Their connexion.

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,

teries, which deſcend down at the ſide of the Breſt-blade; in which place theſe Veins inſinuating themſelves through the ſubſtance of the Muſcles, are a little above the Navel conjoined with the *Epigaſtricks*, whoſe original 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*. How the breſts and womb communicate each with other.

They are of a cold and moiſt temper; wherefore they ſay, that the bloud 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 * *Retradeſcere.* 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 Child is nouriſhed through certain ſmall and crooked paſſages, which though they appear manifeſt to the ſight, whileſt 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 Proſtates. The Nipples.

CHAP. IV.

Of the Clavicles or Collar-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-blade and Neck, therefore I think it better to defer the explanation of theſe Muſcles, until ſuch time as I have ſhewed the reſt of the contained and containing parts, not onely 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 lies in us, we may ſhun confuſion.

Wherefore to return to our propoſed task; after the aforeſaid Muſcles, come the Collar-bones, *Sternon*, and Ribs.

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.

Therefore a Bone is a part of our Body moſt terreſtrial, cold, dry, hard, wanting all manifeſt ſenſe, if the Teeth be excepted. What a Bone is.

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 eyes, unleſs (as *Galen* ſaith) by plucking ſuch Coats away from the parts. A double ſenſe. *Lib* 1. *de Locis affectis.*

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, onely to yield ſo much nouriſhment to the part, as ſhould be needful; for ſeeing the ſubſtance of the Bones is cold, hard, denſe and ſolid, it waſtes the leſs. Why the Bones have ſuch ſmall Veins.

Wherefore they need not ſo much bloud for their nouriſhment, as the hot and ſoft parts; and beſides the leſſer Bones have neither Veins or Arteries, but draw fit nouriſhment, onely by the force of the attractive faculty implanted in them.

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 Collar-bones. Whence the difference of Bones may be taken.

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 *Clavicula* 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. The Clavicles or Collar-bones.

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 Collar-bones, is called by the Latines *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* calls the ſmall Griſle-bone, although it be nothing elſe but a production of the *Os juguli*. *Lib.* 13. *de uſu Part. cap.* 13.

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 Collar-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 Vital parts.

The Ribs are 24 in number, on each ſide 12, ſeven of theſe are called true or perfect Ribs, becauſe The Ribs.

cauſe they make a circle, at the one end joined to the *Sternon*, on the other to the *Vertebraes*; 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 of the *Sternon* by Griſles and Ligaments, but on the back-part to the tranſverſe *Vertebraes* of the Back-bone, and to the ſides of the ſaid *Vertebraes*. But the ſhort Ribs are onely knit to the *Vertebraes*, wherefore that part of the *Vertebraes* is called the roots of the Ribs.

Their Conſiſtence.

The exterior, 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 Anatomical 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 lies hid in the inner part thereof, it cannot be ſhewn unleſs by pulling aſunder of the *Sternon*; wherefore we muſt now ſhew the manner of opening the *Sternon*, that hereby they may not violate the original or inſertion of any of the Muſcles. Wherefore firſt you muſt underſtand, that he which will ſhew in their proper place their original and inſertion of the pectoral 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 pectoral Muſcles from 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 *Hyoïs*, 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 outward toward the Arm; that ſo the containing parts of the Cheſt may not lie onely open to view, and be eaſily ſhewed, but alſo the Muſcles may be contained in their place, until they come to be ſhewed in their order.

And becauſe the Collar-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 ſhewn by the way, who have their original 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 natural parts, binding and holding them in their places, ſo this Coat inveſts all the Vital parts in general, becauſe it is ſtretched over all the inſide of the Cheſt, but in particular whileſt it gives each a Coat from it ſelf.

Its original.

It hath its original from the *Perioſteum* (or, as others will have it, from the *Pericranium*) inveſting the *Vertebraes* 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 Pleuriſie, 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 Pleuriſies, 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 onely to proſecute thoſe things which are manifeſt to the eyes; wherefore we ſay, that the Ribs are lined on the inſide with a double Coat; One which immediately and firmly ſticks to them on every ſide called the *Perioſteum*, which is common to them and other Bones. The other which lies upon that *Perioſteum*, and on the inſide inveſts all the Ribs, whence is it called the *Subcoſtalis tunica*. The ſubſtance, temper, and compoſure, are the ſame, as in other membranes.

The

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. The Coat is commonly called the *Pleura*, from the name of the part which it covers or lines, (for the *Greeks* call the Ribs Πλευρὰ,) and in like manner that which happens betwixt the *Periosteum* and this *Pleura*, is called either a true or bastard Pleurisie. The Magnitude and Figure.

CHAP. VII.

Of the Mediastinum.

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, thickness, composure, number, temper, as the *Pleura*. For the substance of the *Mediastinum* is membranous, and though it be stretched all the length of the Chest, yet it is of a small thickness, receiving Veins, Nerves and Arteries from all the parts to which it is knit, like as the *Pleura* doth; but especially from the Mammillary Vessels, descending under the *Sternon*. The Substance and Magnitude.

It is in number one, but it is made of two Membranes produced from the Subcostal: for this ascending on each side by the hollowness of the Chest to the *Sternon*, and then at right Angles, is reflected to the bodies of the *Vertebraes*, whence the *Pleura* hath it original.

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 humour besides Nature, which you may draw out, or evacuate, by opening the *Sternon*.

Yet I would gladly learn of *Columbus* by what signs we may know that such an humour 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 original. The Figure.

The use thereof is to separate the Vital 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. The Use.

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.*

ALthough the Midriff may seem to be accounted rather a part containing 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. What the Midriff is.

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 *Peritonæum*, 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 *Vertebraes* 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 Natural and Vital parts. It hath connexion with the lower part of the *Sternon* and Short-ribs, and the two first *Vertebraes* of the Loins, but by its Coats and Vessels with the parts from whence it received them. Its substance, composition, &c. Connexion.

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 original. Quantity.

The action thereof is to help the expulsion of the Excrements by the mutual assistance of the *Epigastrick* Muscles: but the chief use is for respiration, of which it is one of the prime instruments. This partition the Ancients called *Phrenes*, because the inflammation thereof caused like symptoms, 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 *Vertebraes* of the neck. This Muscle differs from other Muscles, especially 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. Action. Why the *Diaphragma* was called *Phrenes*.

CHAP.

CHAP. VI.

Of the Lungs.

Their Substance. Quantity. The Lobes thereof.

THe Lungs are of a soft substance and fleshy, rare and like a Sponge, of a various colour pamered; 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 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 Lobe 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 tied to the Heart chiefly at its basis, but to the roots of the ribs, and their *Vertebraes* by the Coat it hath from thence; but by the Vessels to these parts from whence they proceed. But oftimes presently from the first and natural conformation they are bound to the circumference of the Ribs by certain thin and membranous productions which descend from thence to the Lungs, otherwise they are tied to the Ribs by the *Pleura*.

The sticking of the Lungs to the Ribs.

Their nourishment.

The nourishment of the Lungs is unlike to the nourishment of other parts of the Body; for you cannot find a part equally rare, light, and full of air, 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 Throttle, is the chief instrument of the Voice; for the Weazon first prepares the Voice for the Throttle, in which it being in some measure formed, is perfected in the Palate 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 quill to play withall.

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 Vocal matter, which must be sent forth in making or uttering a Voice.

Why the Lungs are light.

Nature would have the Lungs light for many reasons; the first is, That seeing they are of themselves immoveable, they might be more obsequious and ready to follow the motion of the Chest; for when it is straitned, the Lungs are straited 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.

Another cause is, That by this their rarity they might more easily admit the entring air at such times as they have much or sudden necessity, as in running a Race.

And lastly, That in Pleurisies and other purulent abscesses of the Chest, the *Pus* or matter poured forth into the capacity of the Chest, may be sucked in by the rare substance of the Lungs, and by that means the sooner sent forth and expectorated.

The use of respiration or breathing.

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 avoiding the hot fuliginous vapour. Therefore the Chest performs two contrary motions, for whilest it is dilated it draws in the encompassing the air, and when it is depressed, it expels the fuliginous vapour of the Heart; which any one may easily perceive by the example of a pair of Smiths Bellows.

CHAP. X.

Of the Pericardium, *or Purse of the Heart.*

Whence it hath its matter.

THe *Pericardium* is (as it were) the house of the Heart, which arising at the basis thereof (either the Ligaments of the *Vertebraes* situate there, or else the Vessels of the Heart yielding 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 motion. Wherefore the bigness of the *Pericardium* exceeds that of the Heart.

It consists of a double Coat, one proper, of which we have spoken; another common, coming from the *Pleura*; and also of the 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 sixth conjugation.

It

It is onely one, placed about the Heart, and annexed to it at the baſis thereof by its Membranes, to the original of the Lungs, and the *Vertebraes* 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 certain natural 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. Uſe.

For this Palpitation happens alſo to hearty and ſtout men, whoſe hearts are hot, but bloud thin and wateriſh, by reaſon of ſome infirmity of the Stomach or Liver; and this humour may be generated of vapours which on every ſide exhale into the *Pericardium* from the bloud 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. From whence the matter of the watery humour contained in the *Pericardium*.

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 been bony, it would have made the Heart like Iron by the continual attrition; on the contrary, if it had been ſoft and fungous, it would have made it ſpongy and ſoft like the Lungs. The Conſiſtence.

CHAP. XI.

Of the Heart.

THe Heart is the chief Manſion of the Soul, the Organ of the Vital Faculty, the beginning of Life, the Fountain of the Vital Spirits, and ſo conſequently the continual nouriſher of the Vital Heat, the firſt living and laſt dying; which becauſe it muſt have a natural motion of it ſelf, was made of a denſe, ſolid, and more compact ſubſtance than any other part of the Body. What the Heart is, and of what ſubſtance.

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 bloud 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 Vital Spirits into the great Artery *Aorta*, and the cholerick bloud to the Lungs by the *Vena arterioſa* for their nouriſhment; It hath the oblique in the midſt to contain the air and bloud drawn thither by the fore-mentioned Veſſels, until they be ſufficiently elaborate by the Heart. The three ſorts of Fibers of the Heart.

All theſe Fibers do their parts by contracting themſelves towards the original, 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 *Vertebraes*, which chiefly appears in the point thereof.

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. The Magnitude.

The figure thereof is pyramidal, that is, it is broader in the baſis, and narrower at his round point. Figure.

It is compoſed of the moſt denſe fleſh of all the body, by the effuſion of bloud at the diviſions and foldings of the Veſſels, and there concrete, as it happens alſo to the other entrails. For the bloud being there a little more dried 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 cicatrize. Compoſition.

It hath the Coronal 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 eye diſcern that the Heart hath any other Nerves than thoſe which come to it with the *Pleura*. The proper Veſſels.

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. The Nerves.

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. Number and Site.

It hath connexion with the fore-mentioned *Vertebraes*, but by the parts compoſing it, with thoſe parts from whence it hath them; with the Lungs by the *Vena arterioſa* and the *Arteria Venoſa*; and laſtly, with all the parts of the body by the Arteries which it ſends to them all. Connexion.

It is of a hot and moiſt temper, as every fleſhy part is. The action thereof is, firſt to prepare the bloud in its right Ventricle, for the fit nouriſhment of the Lungs; for from hence it is that *Galen* ſaith the right Ventricle was made for the neceſſity of the Lungs. Secondly to generate the Vital Spirits in its left Ventricle for the uſe of the whole body: But this Spirit is nothing elſe than a certain Temper and Action. What the Vital Spirit is.

certain middle substance between Air and Bloud, fit to preserve and carry the native heat, wherefore it is named the Vital, 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 doubtful, whether they may be reckoned amongst the external or internal parts of the Heart, I will here handle in the first place.

The *Auriculæ cordis*, or Ears of the Heart.

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 entering 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 Bloud and Air, and then by little and little draw it forth for the use of the necessity of the Heart. But if any enquire if such matters may be drawn into the Heart by the onely force of the *Diastole*, *ad fugam vacui*, for avoiding 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 then a Fire draws the adjacent Air, and the flame of a Candle the Tallow which is about the wick for nourishments sake. Whilest the Heart is dilated it draws the air, whilest it is drawn together, or contracted, it expels it. This motion of the Heart is absolutely natural, as the motion of the Lungs is animal. 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 bloud 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.

Their magnitude and number.

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 have both connexion. We have formerly declared what use they have,

Their use.

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.

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.

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 bloud 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 yield matter for the generation of the Vital spirits.

Why the right Ventricle is more capacious and less compact.

Therefore because it is needful there should be so great a quantity of this bloud, it was likewise fit that there should be a place proportionable to receive that matter. And because the bloud which was to be received in the right Ventricle was more thick, it was not so needful that the flesh to contain it should be so compact; but on the contrary, the arterious bloud and vital spirit have need of a more dense receptacle, for fear of wasting, and left 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 bloud and spirits.

The action of the right Ventricle.

Therefore the right Ventricle of the Heart is made for preparation of the bloud appointed for the nourishment of the Lungs, and the generation of the vital spirits, as the Lungs are made for the mitification or qualifying of the Air. Which works were necessary if the Phylical Axiom be true, *That like is nourished by like*, as the rare and spongious Lungs with more subtil bloud; the substance of the Heart gross and dense, with the veinous bloud, as it flows from the Liver, that is gross.

The action of the left Ventricle.

And it hath its Coronal 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 vital 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 bloud carried by the hollow Vein to the Heart; the lesser opens a passage to the *Vena arteriosa*, or the cholerick bloud 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 vital spirit through all the Body; but the lesser gives egress and regress to the *Arteria venosa*, or to the air and fuliginous vapours. 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 eleven 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.

These Valves differ many ways: First in action; for some of them carry in matter to the Heart, others

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 Pyramidal 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 later are wholly membranous. Fifthly, 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 needful 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.

Action.
Site.
Figure.
Substance.
Number.
Motion.

Why there be only two Valves at the orifice of the *Arteria venosa*.

CHAP. XII.

Of the distribution of the Vena arteriosa, *and the* Arteria venosa.

HAving hitherto shewed the original 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 eyes, 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 infinite other branches, dispersed in the places over the Lungs.

The artery always lies under the vein.

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 end, that is, to nourish the Lungs, by reason of the continual motion of their contraction and dilatation.

A twofold reason why the vein was made arterious, or like an artery.

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 yielding to the agitation of the Lungs) that so it might have nourishment, which might be distated 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 carried out of the right and 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 carried 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 probably. *Botallus*, in his Treatise *de Catarrho*, hath found out a third way, to wit, a vein, which he calls *Arteriarum nutrix*, that is, the nurse of the arteries, which creeps a little above the coronal 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 *Botallus*, is that vessel observed by *Fallopius*, whereby the *Vena arterialis* is joyned to the *Aorta*, and by which all the vital blood is carried for the forming and nourishment of the Lungs while 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 *Fallopius* 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 disser. Arteriarum. Gal. l. 15. de usu partium, cap. 6.*

CHAP. XIII.

The Distribution of the ascendent Hollow-vein.

Gal. lib de form. fœtus. The greater descendant branch of the 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, and by the way, receives certain other branches from the substance of the liver, which enter not into the great trunk 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 trunk together with the ascendent, although indeed it always doth. But the lesser branch ascends to the upper parts, and is distributed after this manner following: For first arising into the midriff, 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 Coronal 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 intercostal 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 ribs. Moreover also, this *Azygos* sometime, though but seldom, 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 Pleurisie. 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 *Fallopius* gathers, that it is very convenient in the beginnings of Pleurisies, 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 *Axillaris*, which *Sylvius* calls the *Subclavia*. Sixthly, 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*, yield nourishment to the two inner muscles of the chest, to the seven intercostal muscles of the true ribs, to the *Sternon* it self, and to its ligaments and gristles, as also to the *Mediastinum* and the upper part of the right muscles, and the adjacent parts. Seventhly, it produces the *Cervicalis*, which on both sides through the holes of the productions of the *Vertebræ* of the neck, ascends to the head, sending many small branches into the spinal marrow through the holes by which the nerves pass; and also into the membranes, ligaments, gristles, bones, and neighbouring muscles. Eighthly, the *Musculosa*, or musculous, which also arising out of the *Subclavia*, is divided into two other branches: The one whereof goeth upon the breast to the paps nourishing the fore-most muscles; wherefore in a bastard-pleurisie, cupping-glasses may be fitly applied in this place.

This *Azygos* sometimes two.

How the matter of a pleurisie may be evacuated by urin.

Intercostalis.

Mammariæ.

Cervicalis.

Musculosa.

In what place cupping-glasses may be fitly applied in a bastard pleurisie.

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 internal and external. The internal 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, yielding 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 sixth conjugation, where they become one common vessel, 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* near to the hole of the third and fourth conjugation of nerves. The external 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.

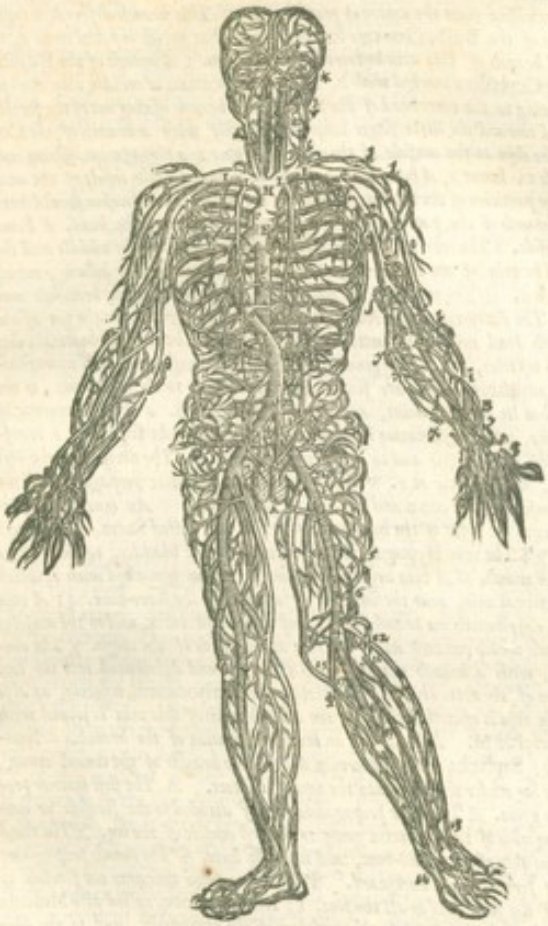
Axillaris. Humeralis. Jugularis interna, externa.

Into what parts the *Jugularis interna* goes.

Into what parts the *Jugularis externa* goes.

The

The Figure of the hollow vein, whole and freed from the rest of the body.



A *The trunk of the hollow vein. The lower* A A, *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 midriff.*

C *The left midriff-vein called* Phrenica sinistra, *from which sprecles do run in a man unto the purse of the heart; for the midriff 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 sprickleth his sprecles on the outside thereof as far as to the cone or point.*

FF *The trunk of the vein* Azygos *or* non-paril, *descending along the right side of the rack-bones unto the loins.*

G G *The lower intercostal veins, to the branches of the vein* Azygos, *which go unto the distances betwixt the ribs, and afford sprecles unto the muscle 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* Jugulum *under the breast-bone.*

II *The subclavian branch tending on either side unto the arm, called by some* Axillaris. K *The upper intercostal vein which commonly sendeth three slips unto the distances of the upper ribs, unto which the first intercostal vein sent no branches.* L L *The descending mammary vein: This descendeth under the breast-bone unto the right muscles of the* Abdomen, *and affordeth sprecles to the distances of the gristles of the true ribs, to the* Mediastinum, *the muscles that lie upon the breast and the skin of the* Abdomen. M *The conjunction of the mammary with the Epigastrick vein ascending about the navel under the right muscles.* N *The vein of the neck called* Cervicalis, *ascending towards the skull, which alloweth sprecles to those muscles that lie upon the neck.* O *The vein called* Muscula, *which is propagated with many sprecles into the muscles that occupy 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 shoulder-blade and the neighbour muscles; so also betwixt* P *and* R *sometimes small veins do reach into 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 skull after it hath bestowed some sprecles upon the rough artery.* T *The external Jugular vein.* V *The division of this vein under the root of the ear.* X *A branch of the external Jugular branch distributed near the* Fauces *into the muscles of the chops, and the hole skin of the head.* Y *the exterior 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 Navel or* Occiput. a a *The vein called* Cephalica *or the external 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 external 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 his branch certain circles are divided into the skin, the chief whereof is marked with* k. l *The third branch at the wrist which is joyn-*

ed 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 sureles upon the muscles that issue from the external protuberation. This branch descendeth together with the fourth nerve.* q *Division of the* Basilica *into two branches, and that which is noted with* q, *is ever accompanied with an artery.* r *A branch of this vein bestowed upon 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* a. 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 elbuit. 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.* α *The* median *or common vein.* β *The partation of the* median *vein above the wrist. This division should have been made above* γ. γ *The external branch of the partition which goeth to the outside of the head.* δ *From which issueth a small branch to the inside.* ι *The internal branch under* ι, *which toward the middle and the ring finger is especially disposed.* ϙ *The vein of the thumb dispersed into the mountainet or hillock, which is conjoyn'd with the branch noted with* δ. ζ *The trunk of the hollow-vein from which issue branches unto the parts seated under the liver.* ν *The fatty vein called* Adiposa siniſtra, *which goeth unto the fat of the kidneys.* θ ι *The two Emulgents which lead whey-blood unto the kidneys.* λμ *The two spermatical veins leading the matter of the seed unto the testicles.* V *The beginning of the hidden vessel called* Vas varicosum. ξ *The veins of the loins called* Lumbares, *which are sent in the knots or knees to the rack-bones, to the marrow of the back, to the muscles that lie upon the loins, and to the* Peritonæum. o *The bifurcation of the hollow vein into the Iliack branches, which bifurcation is not unlike* >. π Muscula superior, *a transverse branch going to the muscles of the* Abdomen, *and to the* Peritonæum. ρ σ *The division of the left Iliack vein, into an inner branch at* ρ, *and an utter at* σ. τ Muscula media, *the utter propagation of the branch* ρ. *Distributed through the muscles of the* coxa *and the skin of the buttock.* υ *An inner propagation of the same branch* ρ, *which goeth unto the holes of the holy-bone.* ΦΨ *The vein called* Sacra, *which goeth unto the upper holes of the holy-bone.* χ *The vein* Hypogastrica *distributed to the bladder, to the muscles of the fundament, and the neck of the womb.* ω *A vein arising from the utter branch marked with* σ, *which is joyned with some branches of the internal vein, near the holes or perforations of the share-bone.* 31 *A vein which when it is passed the share-bone, distributeth one branch into the cap of the* coxendix, *and to the muscles of that place.* ν. *Another small branch which runneth under the skin at the inside of the thigh.* χ *The congress or meeting of the fore-said vein, with a branch marked with* char. 2. *and distributed into the leg.* 1 *The* Epigastrick *vein, a propagation of the utter branch* σ *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 navel at* M. Δ Pudenda *an inner propagation of the branch.* σ *Running overthwart unto the privities.* ☉ ☿ Saphæna *or the ancle-vein or the inner branch of the crural trunk, which creepeth through the inside of the leg under the skin unto the tops of the toes.* Λ *The first interior propagation of the* Saphæna *offered to the groin.* Ξ *The utter propagation thereof divided to the foreside or outside of the thigh.* Π *The second propagation of the* Saphæna *going to the first muscle of the leg.* Σ *The third propagation of the* Saphæna *going to the skin of the whirl-bone, and unto the ham.* Φ *The fourth propagation of the* Saphæna *dispersing his muscles forward and backward.* Ψ *Branches from this unto the foreside of the inward ankle, to the upper part of the foot, and to all the toes.* Ω Ischias minor, *called also* Muscula interior *the utter branch of the crural trunk divided into the muscles of the* coxendix, *and to the skin of that place.* 12 *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 crural veins divided under the knee.* 5 *From this, a surele 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 Sural-vein into an exterior trunk* 9, *and an interior* 14. 10 11 *The division of the exterior trunk under the knee into an external branch, which along the brace attaineth unto the muscles of the foot,* 11 *and an internal.* 12 13 14 *Which descending along the outside of the leg to the upper 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. 15 *The interior branch of the Sural-vein which runneth into the back-side of the leg.* 16 *A branch hereof descending to the inside of the heel, and the great toe, and is divided into divers sureles.* 17 Ischias major *issuing out of the internal trunk at* 14, *and running through the muscles of the calf.* 18 *A propagation hereof is derived unto the upper part of the foot, and affording two sureles to every toe.* 19 *The remainder of the inner inner trunk, behind the inner ankle approacheth to the bottom of the foot, and is consumed into all the toes.* 20 *The commixtion of the vein* Poplitea *with the small or calf-branch at* 13.

Where the external Jugular-vein may be fitly opened in the 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 skull, 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, joyned 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 partr of the face, and at length by meeting together of many branches, it makes in the fore-head of the vein which is called *vena recta*, or *vena frontis*, that is, the fore-head vein. The

Vena recta.

fourth

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 ſagittal ſuture, at length goeth ſo far, that it meets with the *Vena frontis*, which meeting is the cauſe, that a vein opened in the fore-head, 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 the head, ſo that the *Vena pupis* being opened, may make revulſion of the matter which cauſeth the internal pains of the head. *Vena pupis.*

CHAP. XIV.

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 carried 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 ſixth conjugation.

Now the ſixth conjugation brings forth three pair of nerves; for paſſing out of the skull, 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 coſtal branch, is ſo called, becauſe deſcending by the roots of the ribs, even to the holy bone, and joyning themſelves to theſe which proceed from each of the *Vertebra's* of the ſpine, they are carried to all the natural parts. *Ramus Coſtalis.*

The *Recurrens*, or recurrent, is alſo ſo 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 natural part. 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.*

By how much the nerves are nearer the original, to wit, the brain, or ſpinal-marrow, they are by ſo much the ſofter. On the contrary, by how much they are further abſent from their original, 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 ways, chiefly makes that mouth or ſtomach, which is the ſeat of the animal appetite (as they term it) and hunger, and the judger of things convenient or hurtful for the ſtomach. But from thence they are diverſly diſſeminated over all the body of the ventricle. An anatomical *Axiome.* Why Nature would have the vocal nerves recurrent. *Ramus Stomachicus.*

Moreover the ſame branch ſends forth ſome ſmall braaches 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 joyn 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.

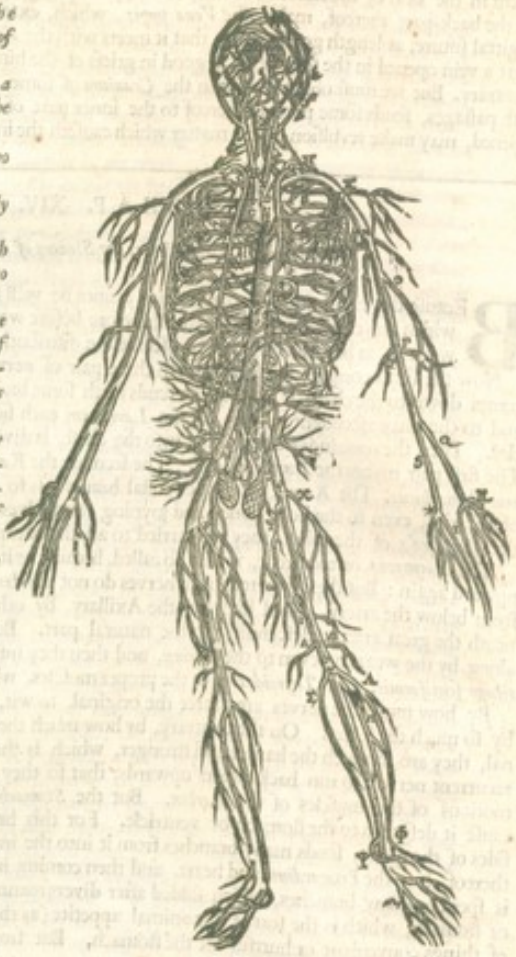
THe artery ariſing forth of the left ventricle of the heart, is preſently (the two coronal arteries being firſt ſpread over the ſubſtance of the heart) divided into two unequal branches. The greater whereof deſcends to the lower parts, being diſtributed, as we formerly mentioned in the third Book, Chap. 22. 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, until 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 than the right.

Firſt, it produces the intercoſtal, and by it imparts life to the three intercoſtal muſcles of the four upper ribs, and to the neighbouring places. The diſtribution of the left ſubclavian artery into the, 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.*

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 intercoſtal 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 rack-bones of the neck attaineth to the ſcull, beſtowing ſurcles unto the marrow and his neighbour muſcles.*

G *The left mammary artery running under the breaſt-bone, and to the navil. It diſtributeth the ſurcles to the* Mediaſtinum, *the muſcles of the breaſt, 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 axillary artery running out into the arm, and affording branches unto the muſcles thereof.*

O *A branch reaching to the outſide of the cubit lying deep.*

PP *branches to the joynt 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.* R *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* Ulna, *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, *divided into branches, as the right is divided.* Z Carotis dextra, *called alſo* Apoplectica *and* Lethargica. 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 forebranch hereof creeping up the temples.* h *The back-branch running on the back-ſide of the ear under the ſkin.* i *The trunk of the great Artery, deſcending unto the ſpondils of the back.* kkk *the lower* intercoſtal *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 midriff called* Phrenica *or* Diaphragmatica. ζ Meſenterica ſuperior, [*but you muſt note, that above* ζ *the trunk of the* Cœliacal *artery is taken away, leſt the multitude of letters in ſo ſmall a Table ſhould breed obſcurity.*] θ η *The right and left* Emulgents *running from the* Aorta *or great artery unto the kidneys.* ι ικ *The ſpermatical arteries on either ſide going to the teſticles.* λ *the lower meſenterical 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.* νι *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

the inner branch going to the bladder, the yard, and the neck of the womb. ℘ *The umbilical artery.* ☌ *The remainder of the branch* ξ, *aſſuming an addition from the outer branch, near* Φ, *and ſo paſſing through the hole of the ſhare-bone into the leg.* ♈ Epigaſtrica, *it aſcendeth upward unto the right muſcle of the* Abdomen, *and about the navel is joyned with the mammary artery.* ♉ Pudenda, *it creepeth crooſſewayes the ſhare-bone.* ♋ *The* Crural *trunk without the* Peritonæum. ♌ Muſcula cruralis exterior, *going into the fore-muſcles of the thigh.* ♍ Muſcula cruralis interior, *going unto the muſcles of the inſide of the thigh.* ☍ *The conjunction of this artery with the branches.* ♈ Poplitea, *going to the muſcles on the back-ſide of the thigh.* ΔΔ *Which communicateth ſmall branches to the joynt of the knee, and the muſcles that make the calf of the leg.* ⊙ *The diviſion of the* Crural *artery under the ham into three branches.* ♎ Tibiæa exterior, *it accompanieth the brace-bone, and is conſumed into the muſcles.* ♐ *The chief part of the* crural *artery.* Σ *The upper and backer* Tibiæa. ♑ Φ *The lower and backer* Tibiæa *running unto the upper ſide of the foot at* Φ. ♒ *A propagation of the* crural *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.*

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.*

Fifthly, having wholly left the cheſt, it ſends forth the two *Humeraria*, 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 muſcles ſituate there, and the gibbous part of the ſhoulder-blade. 5. *Humeraria duplex.*

Sixthly and laſtly, it produces the *Thoracica*, which is alſo 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. 6. *Thoracica duplex.*

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 internal jugular vein, by the ſides of the *Aſpera Arteria*, or wind-pipe, when they come to the *Pharinx*, they are divided on each ſide into two branches, the one internal, the other external. The internal and greater is ſent to the *Pharinx*, *Larinx*, and tongue; then entring into the head by the long hole and 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*, and then the membrane or *Plexus Choroides*. The external or leſſer branch of the ſleepy arteries goes to the cheeks, the temples, and 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 diſtribution of the right ſubclavian artery. The *Carotides*, or ſleepy arteries. Their diviſion. The diſtribution of the internal branch of the ſleepy arteries. To what parts the external branch of the ſleepy artery arrives.

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 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 bigneſs, 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 hardneſs of the cheſt; and beſides, that, as it were by this prop or ſtay, the diſtributions of theſe 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. What the *Thymus* is. The uſe. The magnitude.

CHAP. XVII.

Of the Aſpera Arteria, *the rough Artery or Weazon.*

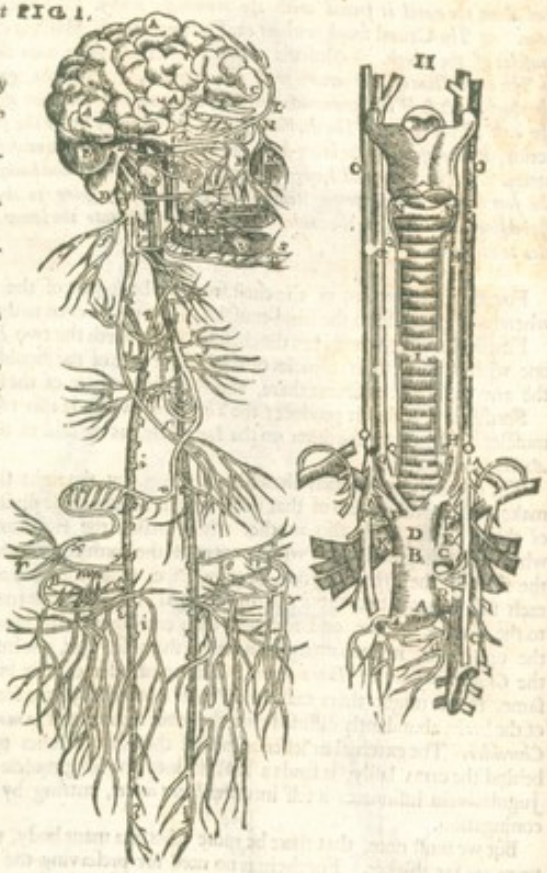
THe *Aſpera Arteria*, or Weazon, ſeeing it is the inſtrument of voice and reſpiration, is of a griſtly, ligamentous, and wholly various ſubſtance. For if had been one rough and continued body with the *Larinx* or throttle, it could not be neither dilated nor compreſſed, opened, nor ſhut; neither could it order the voice according to our deſire. The ſubſtance.

The

The Figure of the Aſpera Arteria, *or Weazon.*

A *The orifice of the great artery, cut from the heart.*
aa *The coronal arteries of the heart.*
BGD *The diviſion of the great artery into two trunks; the deſcending* G, *the aſcending* D.
E *The left axillary, or ſubclavian artery.*
F *The right axillary or ſubclavian artery.*
G *The right* Carotis *or ſleepy artery.*
H *The left* Carotis.
I *The trunk of the rough artery or weazon.*
KL *The diviſion of the rough artery into two branches, of which the right goes into the right, and left in 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.
NN *Certain glandules or kernels at the root of it.*
OO *The right and left nerves of the ſixth and ſeventh 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 of the great artery.*
SS *The left recurrent nerve.*

FIG. I.



Compoſure. It is compoſed of veins from the internal Jugular, of arteries ariſing from the *Carotides*, and of nerves, proceeding from the recurrent branch of a double membrane, of which the external comes from the *Peritonæum*; the internal, which is the ſtronger and woven with the 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 channel, 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

Why the fore-part is griſtly. which give means both to it and theſe circles to be drawn in length; otherſome bring theſe griſtles into a perfect circle, which alſo yield them means of dilatation. Theſe ligaments cover the inner ſuperficies, but the griſtles are placed without, to reſiſt the incurſion of external 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 whileſt 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.

The number and ſite. The diviſion of the weazon through the lobes of the lungs.

All theſe branches are griſtly even to the ends. They are ſituate between the ends of the *Arteria venoſa*, and the *Vena arterioſa*, that the entrance of 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

The temper and action. action is to carry the air to, and vapours from the lungs; that by dilating, but this by preſſing the griſtles together.

CHAP.

CHAP. XVIII.

Of the Gullet.

THe *Oesophagus*, or Gullet, which is the paſſage of the meat and drink, is of a middle ſubſtance between 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 critical 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 pluck'd down, as it were, with 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 vomitting and breaking of wind. Theſe two coats are continued with the two coats of the ſtomach, and have the like fate. Beſides, the gullet hath theſe parts compoſing it, as a vein from the gate and hollow aſcendent vein; a nerve from the ſixth Conjugation, an artery from that which creeps alongſt the bottom 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 varieties 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 hindered the paſſage of the vital ſpirit to the lower parts. It is only one, and that tied to the fore-mentioned 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 whileſt we ſwallow down, the gullet is drawn downwards, and the weazon upwards, which is the cauſe that we cannot ſup and blow, ſwallow and breathe, 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.

BOOK

BOOK V.

Of the Animal parts contained in the Head.

CHAP. I.

A general description of the Head.

HAving hitherto declared two general parts of mans body, that is, the natural and vital, it is now fit to betake our selves to the last, that is, the animal, 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 wisdom, from whence, as from a fountain, infinite actions and commodities arise. It is seated above the rest of the body, that the animal spirit from thence, as from a Tower, may govern and moderate the whole body, and perform all actions according to the prescript 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, *exuberating* 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 division thereof.

The head is divided into the face, forehead, temples, the forepart, the crown, and hind-part.

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 coronal future. 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 coronal future, even to the future *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 sagittal future, which is sufficiently known. By the *Occiput* or hind-part of the head, that which is terminated by the future *Lambdoides* and the first *Vertebra* of the neck.

The containing parts of 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 mammillary 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-brows have their original 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, arm-holes, groins, and other parts of our bodies.

CHAP. II.

Of the musculous skin of the Head (commonly called the hairy scalp) and of the Pericranium.

What the hairy scalp is.

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 nostrils and corners of the eyes, whereupon it is there called gristly.

Its connexion.

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 dissaminated through all its substance, whereby it comes to pass, that the wounds, contusions and impostumes, that happen in or upon this skin, are not to be neglected.

The

The * *Pericranium*, (but I ſuppoſe it ſhould be the *Periſteum*) 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 termed the *Periſteum*: And as the *Pericranium* takes its original 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 original either from this *Pericranium*, or *Craſſa meninx*, ſending forth their productions, as well by the holes or paſſages of the head, as by thoſe of the ſpinal marrow or back-bone it ſelf even to the holy bone.

* Our Author (with *Falloppius* and *Lowenthus*) confounds the *Pericranium* and *Periſteum*: but *Veſalius*, *Aubanus*, and *Bartholinus* diſtinguiſh them, making the *Pericranium* thin and ſoft, and the *Periſteum* moſt thin and nervous, and of moſt exquiſite ſenſe.

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 ſneeze or cough, perceive an increaſe of their pain, by the paſſage thereof to the brain.

Why the wounds thereof muſt not be neglected.

* The uſe of this *Pericranium* is to cover the skull; and to give notice of things hurtful, by the power of the quick ſenſe which it is endued withal, and the *Periſteum* doth the like in other bones. Beſides, it ſuſtains and faſtens by the ſutures the *Craſſa meninx* to the skull; 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 original from thence.

The *Pericranium* and *Periſteum* of the ſame nature.

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 by conſent.

CHAP. III.

Of the Sutures.

* The uſe of the *Pericranium*.

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 Coronal, 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 *Corollæ*, 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 equal parts, as with a ſtrait line, running the length of it from the coronal to the *Lambdoides* or hind-ſuture.

But this third Suture *Lambdoides* is ſo called, becauſe it repreſents the capital Greek Letter *Lambda* Λ. You muſt underſtand this deſcription of the ſutures, not as always, 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. And 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 roughneſs of the ſecond ſuture *Lambdoides*, ſtaid as at a cleft made in the bone by a ſtroke.

Celſ. lib. 7. c. 9.

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 is, that ſo it might be the ſafer both from internal and external injuries. For the skull, being, as it were, the tunnel of the chimney of this humane fabrick, to which all the ſmoaky vapours of the whole body aſcend, if it had been compoſed of one bone, theſe vapours ſhould have had no paſſage forth.

Why the skull conſiſts of divers bones.

Wherefore the groſſer vapours paſs away by the ſutures, but the more ſubtil 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 breadth from the *Lambdoides*, through which the *Vena pia* enters into the skull, and they are of that largeneſs, that you may put a points tag into them, that the vapours may have free paſſage forth, otherwiſe there would be danger of death; thus Nature hath been careful to provide for man againſt internal injuries; And in like manner againſt external; for it hath made the head to conſiſt of divers bones, that when one is broken, the other may be ſafe, the violence of the ſtroke being ſtaid in the diviſion of the bones.

In what bodies and by what mean, the *vena pia* ſometimes enters into the parts within the skull.

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, and too firmly cloſed; otherwiſe it is impoſſible 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.

In what men one part of the head, being ſtricken, the oppoſite is broken.

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 internal parts communicate with the external, 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 puliion of the brain.

Why we muſt not apply a Trepan to the ſutures.

CHAP.

CHAP. IV.

Of the Cranium, *or Skull.*

What the *Cranium* is.

THe *Cranium*, or Skull covering the brain like an Helmet, is compoſed and conſiſts of ſeven bones; of which ſome are more denſe, thick and hard than otherſome. 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 tie 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 fore-part, and is called the *Os coronale*, or *Os frontis*, the fore-head-bone; it hath the ſecond place in ſtrength and thickneſs. It is bounded by the coronal future, and the ends of the wedg-bone: In this fore-head bone there is often found a great cavity under the upper part of the eye-brows, 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 ſo 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, until they have all their teeth, ſo that it feels ſoft in touching, and 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 vapourous 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 ſagittal ſure, below with the ſcaly, on the fore-part with the coronal, and on the hind-part with the *Lambdoides*.

Oſſa petroſa, or the ſcaly-bone.

The fifth and ſixth bones of the skull, are the two *Oſſa petroſa*, ſtony or ſcaly bones, which are next to the former in ſtrength. They are bounded with the falſe or baſtard-future, and with part of the *Lambdoides*, and wedg-bone.

Os ſphenoides, or the wedg-bone.

The ſeventh is the *Os ſphenoides*, *baſilare*, or *Cuneiforme*, that is, the wedg-bone. 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 Ethmoides, or *Cribroſum*.

There is beſides theſe another bone at the *baſis* of the forehead-bone, into which the mammillary proceſſes end; the Greeks call it ἠθμοειδὲς, the Latines, *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 Anvil, 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.

The three bones of the Auditory-paſſage.

But alſo in ſome skulls 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 futures, which thing is very fit to be known to a Chirurgion in the uſe of the Trepan.

By what means a Chirurgion may conjecture that there are extraordinary futures in certain places of the skull.

Verily he may give a conjecture hereof, whilſt he ſeparates the *Pericranium* from the skull, for the *Pericranium* is with greater difficulty pluck'd away from the futures, becauſe the *Craſſa meninx* hath ſtraiter connexion therewith by his nervous fibers ſent forth in ſuch places. The skulls in women are ſofter and thinner than in men, and in children more than in women, and in young men more than in men of a middle age. Alſo the *Æthiopians* and Black-moors, as alſo all the people inhabiting to the South, have their skulls more hard and compoſed with fewer futures.

The skulls of ſuch as inhabit the Southern countreys, are more hard and denſe.

Therefore, as it is written by *Hippocrates*, ſuch as have their skulls 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 yields to the perforating Trepan. Moreover in ſome skulls, 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 falls only lightly or ſuperficially upon it, touches a point thereof. But on the contrary, a long wound muſt be upon a plain ſurface, which may be but only ſuperficial.

We muſt obſerve the exuberances beſides nature, which are in ſome skulls.

Another cauſe is, becauſe ſuch bunches change the figure and ſite of the futures. 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 heavy, 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 vapours of the brain.

The ſite and ſubſtance of the *Diploe*.

The

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 internal 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 eyes. Which thing faſtens the *Craſſa meninx* to the skull, and is therefore very worthy to be obſerved.

There may be a deadly rupture of the veſſels of the brain without any fracture of the skull.

For in great Contuſions, when no fracture and 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 will hereafter more at large declare in handling the wounds of the head.

Caution to be had in the uſe of the Trepan.

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 principal membranes of the body; it goes forth by the ſutures and holes of the nerves that proceed out of the skull; and it paſſes forth by the bone *Ethmoides* perforated for that purpoſe, to carry ſmells 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 ſpinal 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 *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.

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* yields 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 duplicate or folded *Meninges* ſeparate the brain from the *Cerebellum*, and ſo from thence they are led by the ſides of the *Cerebellum*, until 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 ſagittal 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 its duty to the creature, as we ſee in ſome that have the Palſie. *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 other *Meninx* or membrane of the brain, called *Pia mater*, is moſt ſlender, interchaſed 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 penetrate in 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 conſiſtence of the *Pia mater*.

The ſenſe of the *Meninges*.

Theſe membranes when they are hurt or afflicted, 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 part 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 principal faculty of the Soul, that is, the Animal and Rational. Man hath this part in greater plenty than any other Creature, for it almoſt fills 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 is of a cold and moiſt Temperature. The laudable temper of the brain is known by the integrity and perfection of the internal and external ſenſes; the indifferency of ſleep and waking, the maturity or ripeneſs of judgment, and conſtancy of opinions, from which, unleſs it meets with better and more probable, it is not eaſie to be moved.

The quantity.

Temper.

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.*

A A 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 coronal suture, which fibers make the* Pericranium.
HH *Fibers passing through the sagittal suture.*
II *Others passing through the Lambdal suture.*
K *A knob which useth to grow to the* Sinus *of the skull.*
L *A cavity in the forehead-bone.*
M *The skull.*
N *The* Pericranium *or skull-skin.*

FIG. I.

II.

Figure 2.

AAA *A part of the* Crassa meninx *dividing the brain.*
BB *The third* Sinus *of the same crass 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 brane.*
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 sudden 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 ill memory, for with like facility as they admit the species 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. The action of the brain is to elaborate the animal spirit and necessary sense serving the whole body, and to subject it self as an instrument to the principal faculties, as to reason. The brain is twofold, the fore and hind. The hind by reason of its smallness is 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 the left, parted by that depression which we formerly mentioned, of the *Meninges* into the body of 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 we say the liver and the 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 and very smooth; when on the contrary, the outward appears indented and unequal with many windings, and crested, as it were, with many worm-like foldings.

Number.

CHAP.

CHAP. VII.

Of the Ventricles and Mammillary Proceſſes of the Brain.

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 foreſide of the *Cerebellum*, towards the beginning of the ſpinal marrow. The two foremoſt 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 ſemi-circle, ſituate at the baſis of the pillar of the middle ventricle towards the noſe under the *Septum lucidum*, or clear partition, ſevering or parting in ſunder theſe two ventricles.

The ſubſtance of the brain is porous, and ſweats forth blood.

The four ventricles thereof.

The magnitude of the upper ventricles of the brain.

The *Septum* is nothing elſe than a portion of the brain indifferently ſolid, but very clear, that ſo through this partition the animal ſpirits contained in theſe two Ventricles, may mutually paſs and be communicated, and yet no other groſſer ſubſtance may pierce the thin denſity thereof.

The *Septum lucidum.*

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* Anterir *wormy proceſs.*

F *The* Poſterior *wormy proceſs.*

GG *In this place the After-brain did grow to the ſpinal marrow.*

H *The cavity in the ſpinal marrow maketh the fourth ventricle.*

IK *The* Anterior *and* Poſterior *proceſſes of the brain, called* Vermi-formes, *or the wormy proceſſes.*

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 died of the Palſie, in which I have found the ventricle of that ſide which was taken with the Palſie 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 always to be found in the ventricles, which may be made by the condenſation of the animal 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.

Why the Palſie of one ſide is not preſently communicated to the other.

This *Plexus choroides* is nothing elſe, but a production of the *Pia mater* diverſly folded with the mutual implication of veins and arteries woven in the form of a net. Theſe veſſels are of magnitude and capacity ſufficient, both to yield life and nouriſhment to that particle to which they are faſtened, as alſo for the generation of the animal 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 mammillary proceſſes. But the mammillary proceſſes are certain common ways for conveyance of the air and ſmells, into the brain, and carrying of excrements from the brain.

The *Plexus choroides.*

For thus in them who have the Catarrh and *Coriza*, or Poſe, neither the air, nor ſmells can penetrate into the brain; when frequent ſneezings 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 breathe 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 notiris 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 external ſenſes, that ſo it may receive a true judgment of them from reaſon, which reſides in the middle ventricle.

The *Proceſſus Mammillares.*

The uſe of the upper ventricles of the brain.

The fourth and fifth Figure of the Brain.

Figure 5.

R R R *The lower* superficies *of the callous body reflected.*

S T V *The* triangular *surface of the* Fornix *or Arch.*

X X *The lower part of the partition of the Ventricle continuated with the arch.*

Y Y *The upper part of the partition continued with the callous body.*

Figure 6.

A A A *The lower surface of the arch.*

B C *Two corners of the arch, by which it is continuated with the ventricles.*

D E *The right and left ventricles.*

F G *Arteries climbing up from the sleepy arteries through the lower side of the ventricles, for the forming of that complication of the vessels, which is called* Plexus choroides.

H *A vessel issuing out of the fourth* Sinus *under the arch, and passing into the third ventricle.*

I K L *The division of this vessel, a part whereof goeth to the right ventricle at* K, *and another to the left at* L.

M N *The* Plexus choroides *made of the artery* F G, *and the vessel* H.

O O *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.

Q *A passage from the third ventricle unto the Bason, or* Tunnel.

R S *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* Q.

FIG. V.

VI

The sixth Figure of the Brain.

Figure 10.

A A *Parts of the spinal marrow cut from the brain.*

B C *The places where this marrow did grow unto the brain.*

D E *The testicles.*

F G *The buttocks.*

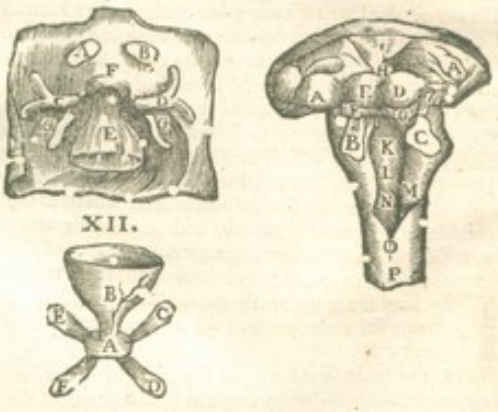
H *The Pine glandule.*

From I *to* K *A part of the third ventricle going to the fourth, under the testicles.*

K L M N *A part of the fourth ventricle which is engraven in the marrow.*

O *The top of the fourth ventricle.*

P *The place where the spinal marrow goeth out of the skull.*



XII.

Figure 11.

A B *Parts of the optick nerves.*

C D *The sleepy arteries.* E *The Bason or Tunnel hanging down.* F *A hole or perforation of the* Dura meninx, *through which the Tunnel reacheth unto the glandule.* G G *Parts of the second conjugation of sinews.*

Figure 12.

A *The glandule.* B *The Bason or Tunnel, called* Pelvis *or* Infundibulum. C D E F. *The four holes through which the phlegmatick excrements issueth.*

The

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, worm-like productions, the bason and passage which is from this middle into the last and hindmost ventricle. The *Psalloides* or Arch, is nothing else, but the cover of the middle ventricle, resembling a roof, born up with three stays or pillars, the one whereof is extended to the nose under the *Septum lucidum*; the two other on each side one, look toward the back-part of the brain. This is the reason of this figure which is outwardly convex, and inwardly concave, to wit, that there might be free space for that motion which the animal spirit inwardly produces, and besides, that it might more easily sustain the burthen 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 animal 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 channel, 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 sudden 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 palat; and is so called, because it hath the similitude and use of a bason, or tunnel; 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 channel or passage, running from this third ventricle into the fourth, for the use formerly mentioned.

Here the *Pelvis* or Bason is confounded with the Tunnel.

This channel descending in its original 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 Tribunal or Judgment-seat, to the reasoning faculty, when the mind will draw conclusions from things seen.

The Channel from the third into the fourth ventricle.

The fourth ventricle 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 cleansed 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* Physicians have not so distinguished in places, the three forementioned 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* Physicians.

The mammillary 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 diverse kind 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 skull.

The use of the Mammillary 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 ways and instruments of the animal 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 marrowy substance of the brain, or spinal marrow. But passing forth of the brain, the 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 ligaments, drawn as well from divers others, as from these by which they are tied to the *Vertebra's*; yet this opinion seems absurd to me, seeing such a membrane, as that which is insensible, wholly repugns 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 diverse 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 *Peritonæum* involves the

Their magnitude.

Their figure.

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 those 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 original immediately from the brain, the other thirty from the spinal marrow.

Their use.

Their number.

The first conjugation of the nerves.

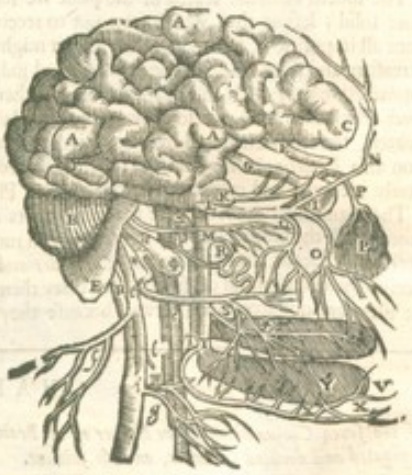
The first Conjugation of the nerves of the brain is thicker than all the rest, and goes to the eyes, to carry the vitive spirit to them. These arising from divers parts of the brain, in the middle way before they go out of the skull meet together cross-wise, like the Iron of a Mill (which is fastned 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 seventh Figure shewing the eighth Conjugation of the Nerves of the Brain.

AA 1 2 *The brain.* BB 1 2 *the After-brain.*
CC 1 2 *The smelling of the brain, which some call the Mammillary processes.*
D 1 *The beginning of the spinal marrow out of the basis of the brain.*
F 1 2 *A part of the spinal marrow when it is ready to issue out of the skull.*
F 1 2 *The mammillary 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 fore-head.*
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 temporal muscles.*
R 2 *A branch of the fourth conjugation crumpled like the tendril of a vine.*
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.*
Φ *The* Auditory-*nerve, spread abroad into the cavity of the stony-bone.*
* *A hard part of the fifth conjugation above, the* * *which may be counted for a distinct nerve.* b 1 2 *A small branch derived from this harder part of the fifth pair.* c 1 2 *A lower branch from the same original.* d 1 2 *This nerve is commonly ascribed to the fifth pair; but indeed is a distinct conjugation, which we will call the Eighth, because we would not interrupt the order of other mens accounts.* e 1 2 *The sixth pair of sinews.* f 2 *A branch from them divided 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 sixth.* l 2 *A propagation of the seventh pair to those muscles which arise from the Appendix called* Stiloides. m 2 *Surcles from the seventh conjugation to the muscles of the tongue, the bone* Hyois, *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 tunnel; and at* p q *is the passage of the* Soporary *arteries to the ventricles of the brain.*

FIG. I.

FIG. II.



The second Conjugation.

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 third conjugation.

The third is twofold, in the passage out of the skull, it is likewise divided into many branches of

of which ſome are carried to the temporal muſcles, into the *Maſſeteres*, or grindling 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 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 fifth as its original, and having not as yet paſſed forth of the skull, is divided into two, 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 temporal muſcles by the paſſage next to it; by which the ſecond conjugation paſſes forth. The fifth conjugation.

The ſixth 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 ſixth conjugation.

The ſeventh inſerted and ſpent upon the muſcles of the bone *Hyois*, 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 conjugation.

CHAP. IX.

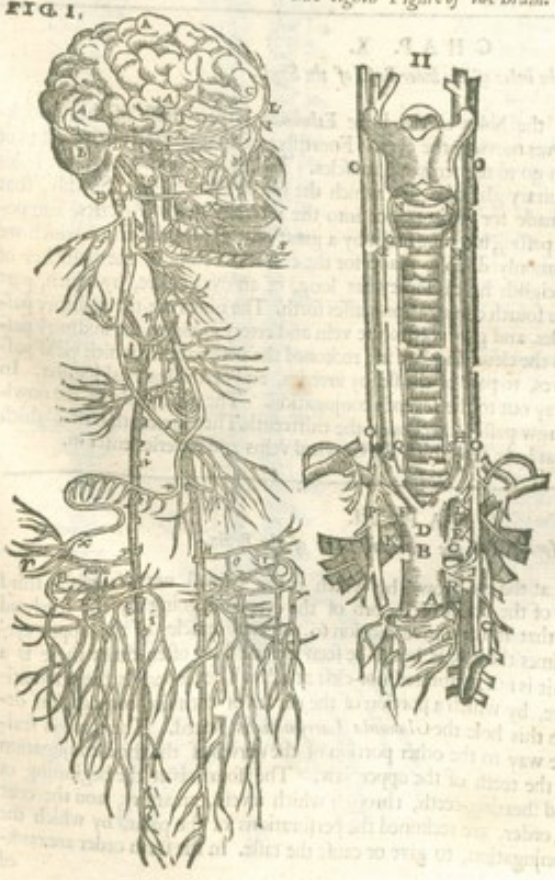
Of the Rete Mirabile, *or wonderful Net, and of the Wedge-bone.*

THE Animal ſpirit is made of the vital, ſent from the heart by the internal ſleepy arteries to the brain. For it was requiſite, that it ſhould be the more elaborate, becauſe the action of the animal is more excellent than that of the vital: 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 wonderful Net) that ſo the ſpirit by longer delay in theſe Labyrinthian or Maze-like turnings, might be perfectly concocted and elaborated, and attain to a greater fitneſs to perform the animal functions. The exiſtence of the animal ſpirit. What the *Rete mirabile* is.

This wonderful Net ſituate at the ſides of the *Apophyſes clinoides*, or productions of the wedg-bone, is two-fold; that is, divided by the pituitary glandule, which is ſituate between the ſaid *Apophyſes clinoides*, having the wedg-bone lying under them, next to the *Craſſa meninx*, being perforated on the right and left ſide, next to which lye bones as a rare as a ſponge even to the palat, by which the phlegm is purged by the mouth and noſe; and there-hence, I think, that ſpatile flows, which ſuch as have a moiſt brain, continually ſpit out of their mouth. The fite and number.

The eighth Figure of the Brain.

FIG. I.



A *The brain.*
B *The* Cerebellum, *or after-brain.*
C *A proceſs of the Brain, but not that is called* Mammillaris.
DD *The marrow of the back, as it is yet within the skull.*
E *The* Mammillary *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 fore-head.*
M *Another branch of the nerve* I, *reaching to the upper jaw.*
NN *A nerve proceeding from the branch* I, *interced or woven with the coat of the noſe.*
O *The nerve of the temporal muſcle iſſuing from the branch* I.
P *A nerve contained 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 ſircle of the branch* R, *offered to the lower lip.* TT *Other ſircles from the branch* R, *attaining to the lower teeth.* V V *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.* b c *Two ſmall branches of the fifth conjugation uniting themſelves with the nerve* P. d *The eighth conjugation or a nerve of the fifth pair attaining unto the face.* e e *The ſixth 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 ſtrengthening the* intercoſtal *nerves, and is therefore called* intercoſtalis. k k *Surcles of the utter branch going to the heads of the muſcles, to the breaſt-bone, and to the collar-bones.* l m *Branches of the right nerve* l, *making the right recurrent nerve.* m n *The inſertion of the recurrent ſinews into the muſcles of the* Larinx. o p *Branches of the left nerve making the left recurrent ſinew* p. q q *Branches from the ſixth 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.* u u *The left ſtomach-nerve going to the right oriſice 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 gall.* z *The nerve belonging to the colick-gut.* α *A nerve creeping to the gut called* duodenum, *and the beginning of the* jejunum, *or empty gut.* β *A nerve implanted in the right ſide of the bottom of the ſtomach.* γ *A nerve belonging to the liver and bladder of gall.* δ *A nerve reaching to the right kidney.* ε *A branch reaching to 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 gall.* θ *Surcles derived to the colick-gut and the gall.* ι *Small branches inſerted into the Spleen.* κ κ *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.* π *A branch derived from the ſixth 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* Larynx. ς *A conjunction or coition of the ſixth and ſeventh pair into one nerve.*

What the *Apophyſes clinoides* are.

Whether the *Rete mirabile* differs from the *Plexus choroides.*

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 wonderful 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 always 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.

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 temporal muſcles. Fifthly, are reckoned thoſe holes ſcarce viſible, ſituate under the pituitary glandule, by which the ſpittle is evacuated. Sixthly, that hole which is in the wedg-bone made for the entrance into the internal ſleepy Arteries, compoſing the wonderful 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 internal Jugular-vein. The eighth hole is ſomewhat long, of an oval 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 yield paſſage forth to the ſixth pair of nerves, to part of the ſleepy arteries, and of the internal jugular. In the twelfth, thoſe which yield a way out to the ſeventh conjugation. The great hole of the nowl-bone through which the ſpinal marrow paſſes, is reckoned the thirteenth. The fourteenth is that which moſt commonly is behind that great hole, by which the Cervical veins and arteries enter in.

CHAP. XI.

Of the perforations of the external 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, often-times there is a cleft in ſtead thereof, other-whiles it is not perforated nor cleft at all. The ſecond is the perforation of the greater corner of the eye, by which a portion of the nerves of the third conjugation deſcends to the coat of the noſe; in this hole the *Glandula Lacrymalis* 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 part of the face, and the teeth of the upper jaw. The fourth is at the beginning of the palat, amongſt the cutting and 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 ſixth order are rank-

ed

ed 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 yoke-bone aſcending into the orb of the eye, by which there is a way, as well for the nerves of the third conjugation to the temporal muſcles, as alſo for certain veins and arteries. But alſo, there is noted another hole at the mammillary 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. XII.

Of the Spinal Marrow, or Pith of the Back.

What the ſpinal marrow is.

THE ſpinal marrow is like a river running from the fountain of the Brain. This ſends nerves for ſenſe and motion to all the neigbouring 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 ſpinal 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 coats of the ſpinal marrow.

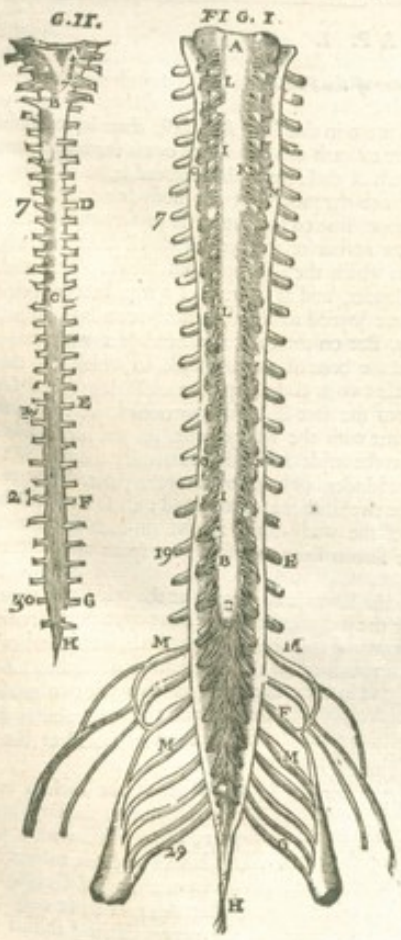
The diſeaſes of this marrow do almoſt cauſe the like ſymptomes, as the diſeaſes of the brain; for they hurt the ſenſe and motion of all the parts lying beneath them; as, for example, If any of the *Vertebra's* of the back-bone be moved out of their place, there follows a diſtortion or wreſting aſide 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 ſpinal marrow for to give life and nouriſhment to it, as the nerves by them paſs forth into all the lower parts of the body.

The diſeaſes from the hurting of the ſpinal marrow.

Figure 1. *Sheweth the form of the ſpinal marrow properly ſo called, with its membranes, and the nerves proceeding from it.*

Figure 2. *The ſpinal marrow naked and bare, together with its nerves, as moſt parts of Anatomiſts have deſcribed it.*

The tenth Figure of the Spinal Marrow.



A *The beginning of the ſpinal marrow where it falls out of ſkull.*
B *The thickneſs thereof in the ſpondyls 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 nerve of the loins.*
From F *to* G *The nerves of the* Os ſacrum, *or holy-bone.*
H *The end of the marrow.*
I K L *Do ſhew how the nerves do iſſue from the marrow in ſtrings.*
M M *The knots of the ſinews made of the conjunction of thoſe ſtrings.*
N O *The membranes that inveſt the marrow.*

Figure 2.

A *The beginning of the ſpinal marrow in the ſkull.*
3 4 5 6 7 *Theſe Characters ſhew (according to* Veſalius *opinion) how the conjugation of the nerves of the brain do take their original ſkull.*
B *From the marrow remaining yet without the egreſs of the ſpinal 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 five pair of ſinews.*
G 30 *The marrow of the holy-bone, and ſix pair of ſinews.*
H *The extremity, or end of the ſpinal marrow.*

The end of the Fifth Book.

BOOK VI.

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 yield 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 original and inſertion of the Muſcles. We have formerly noted, that by the face is meant whatſoever lies from the eye-brows 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 unlikeneſs in their faces; alſo, it hath adorned this part with ſuch exquiſite beauty, that many have died by longing to enjoy the beauty deſired by them. This ſame face albeit it little exceeds half a foot, yet it indicates and plainly intimates by the ſudden changes thereof, what affections and paſſions of hope, fear, ſorrow and delight poſſeſs 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 Anatomical deſcription thereof: Which that we may eaſily and plainly perform, we will begin with the bones thereof; whereby, as we formerly ſaid, the original 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 original 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.

Bones in each orb of the eye.

THe bones of the face are ſixteen or ſeventeen in number. And firſt, there be reckoned ſix about the orbs of the eyes, that is three 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 proceſs of the ſtony-bone, and ſo makes the *Zygoma*, that is, the *Os Jugale*, or Yoke-bone, framed by Nature for preſervation of the temporal 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 *Ægilops* doth breed. The middle is in the bottom, or inner part of the orb, very ſlender, and as it were of a membranous thinneſs: Then follow the two bones of the noſe which are joyned to the fore head-bone by a ſuture, but on the foreſide between themſelves by harmony. But on the back and hind-part with two other bones, on each ſide one, which deſcending from the bone of the forehead (to which alſo they are joyned by a ſuture) receive all the teeth. Theſe two in *Galens* opinion are ſeldom 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 wedge-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 paſs, 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 wedg-bone, receive on each-ſide one of the nerves of the fourth conjugation, which, in the former Book, we ſaid were ſpent upon the membrane of the palat.

What the *Zygoma* is, and what uſe it hath.

The *Ægilops*.

The two bones of the noſe.

The two inner bones of the palat.

The two bones of the jaw.

And in *Galen's* opinion there be other two in the lower jaw, joyned at the middle of the chin; although ſome think it but one bone, becauſe by the judgment 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 their back-part on each ſide two productions, as they lie to the upper jaw, the one of which repreſents the point of a Sword, and is called the *Corone*: Thee other is obtuſe and round; which is inſerted into the cavity ſeated at the root of the proceſs of the ſtony-bone, near to the paſſage of the ear.

Two productions on each ſide of the lower jaw.

The Luxation of the lower jaw.

This may be ſtrained to the fore-part 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 lower jaw filled with a marrowy humor.

This jaw is hollow, as alſo the upper, eſpecially in the back-part, being filled with a white and glutinous humor, conducing to the growth of the teeth. This humor hath its matter from the blood brought thither by the veſſels, veins, arteries and nerves from the third Conjugation entring here by a paſſage large enough. Whereby it comes to paſs, 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

the vein and artery: by ſmall 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 defluxions may be by the arteries; or rather becauſe the humor flowing to the roots of the teeth, may preſs the artery in that place: Beſide alſo you may ſee ſome appearance of a nervous ſubſtance in the root of a tooth newly pluck'd out.

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 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 mayeſt warily and diſcreetly handle the matter, that theſe parts receive no harm.

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 palat, or the partition of the noſe.

There are ſix of the orbs of the eyes, at each three. The ſeventh and eighth we may call the Naſel, or Noſe-bones. The ninth and tenth the Jaw-bones. The eleventh and twelfth are called the inner bones of the palat. The thirteenth and fourteenth, the bones of the lower Jaw. The partition of the noſe may reckoned the fifteenth.

Now it remains, having ſpoken of theſe bones, that we treat of the Teeth, the Eye-brows, the Skin, the fleſhy pannicle, the muſcles; and laſtly, the other parts of the Face.

CHAP. II.

Of the Teeth.

The teeth are bones.

THe teeth are of the number of the bones, and thoſe which haye 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 the *Canini dentes*, Dog-teeth, becauſe they are ſharp and ſtrong like Dogs-teeth; theſe alſo have but one root, but that is far longer than the other have.

The ſhearing-teeth.

The Dog-teeth.

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 half concocted; thoſe grinders which are faſtned into the upper jaw, have moſt commonly three roots, and oft-time four. But theſe which are faſtned into 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 ſtays 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 tidy have performed their duty; for all things are chawed and broken aſunder more eaſily by that which is rough and unequal.

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 picking them with a ſharp Iron. The teeth are faſtened in the Jaws by *Gomphoſis*, that is, as a ſtake or nail, ſo are they fixed into the holes of the jaws; for they adhere ſo firmly thereto in ſome, that when they are pluck'd out, part thereof follows together with the tooth; which I have often obſerved to have been alſo with great effuſion of blood. This adheſion of the teeth faſtned in the jaws, is beſides ſtrengthned with a ligament, which applies it ſelf to their roots together with the nerves and veſſels. The teeth differ from the other bones, becauſe they have action whilſt they chaw the meat; becauſe being loſt they may be generated, and for that they grow as long as the party lives; for otherwiſe by the continual 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 puck'd 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 filled without pain? *Fallopius* 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 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 teeth are faſtned in the jaws by *Gomphoſis*. The faſtening of the teeth into the jaw is to be obſerved. Wherein the teeth differ from the other bones. For what uſe the teeth have ſenſe. The foreteeth help for the articulation of the voice.

But even as there are two large cavities in the forehead-bone at the eye-brow, filled with a viſcous humour, ſerving for the ſmelling; and in like manner, the air ſhut up in the mammillary proceſſes is for hearing: So in the jaws, there be two cavities furniſhed with a viſcid humor for the nouriſhment of the teeth.

CHAP.

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 we 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 unleſs you take a good head 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 fore-part 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 muſcles of the lips.

There are no particular Muſcles appointed to open and ſhut the eye, for that is the broad muſcle only. Divers reaſons to that purpoſe.

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 three ſorts of fibers; although by the opinion of all who hitherto have 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 cometh to paſs, that it alſo in ſome ſort becometh moveable. But although in publick 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.

Why you muſt take heed of making a tranſverſe inciſion upon the eye-brows.

Beſides, when there is occaſion to make inciſion on the eye-brows, we are forbidden to do 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 be meet (becauſe when one of the muſcles is in action, the other, which is its oppoſite or Antagoniſt, reſts or keeps holy-day) that when that which is ſaid to open the eye is employed, the oppoſite thereof reſting, the upper eye-lid ſhould be drawn towards its original, as we ſee it happens in Convulſions; becauſe the operation of a muſcle is the collection of the part which it moves towards its original.

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 original of the broad muſcle.

The original 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 original, by the 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 the Muſcles beſides their original, inſertion, action, compoſition, and the deſignation of their veſſels.

The inſertion, and reaſon why we expreſs ſo many motions with the face.

CHAP. IV.

Of the Eye-lids, and Eye-brows.

What the eye-brows are.

BEcauſe we have fallen into mention of the eye-lids, and eye-brows, 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-brows are nothing elſe, than a rank of hairs ſet in a ſemicircular 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.

Their uſe.

What the eye-lids are.

But the eye-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 always of equal and like bigneſs, implanted at the edges of the griſtly part, that they might always ſtand ſtrait and ſtiff out. They

Their compoſure and uſe.

are

are not thick, for ſo they ſhould darken the Eye. The Griſle 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 hardneſs. They call this ſame Griſle, 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 *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 *Aquæ-duct*. They are of a ſoft ſubſtance, of a large quantity, being bigger or leſſer, according to the bigneſs of the body. They are ſeated in the head, that they might over-look 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 pyramidal 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 hurtful 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, 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 humours 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 lacrymalis*, or weeping Fiſtula. Compoſition. *Glandula Lacrymalis.* *Fiſtula Lacrymalis.*

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 ſlipperineſs 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 continual and perpetual motion would be ſubject to exceſſive drineſs. For Nature for the ſame reaſon hath placed Glandules flowing with a certain moiſture near thoſe parts which have perpetual agitation. Why fat is placed about the Eyes.

CHAP. VI.

Of the Muſcles, Coats, and humours of the Eye.

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 endeavour, they draw the Eye inwards. But if the upper onely 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 number ſite, and action of the Muſcles.

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 lacrymalis* 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 *Fallopius*, or rather, which I remember, I have always 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 ſixth Muſcle is contrary to that, for that it hath its original 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, whileſt 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 often-times taken but for one. That thou mayeſt truly and accurately obſerve this anatomical 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 fore-mentioned original of the Muſcles. 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 Rainbow. The duty of it is to ſtrengthen, bind, and contain the Eye in its orb, wherefore it had the name *Conjunctiva*; others call it *Adnata*, or *Epiſcleros*. The five coats of the Eye. 1. *Conjunctiva*, or *Adnata*.

The ſecond is called the *Cornea*, becauſe it reſembles a Horn in colour and conſiſtence; this

2. *Cornea*, or the Horny Coat.

coat differs and varies from it ſelf; for in the fore-part, 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 humour, but withall tranſparent, ſo to give the object a free paſſage to the Cryſtalline. It hath its original from the *Craſſa Meninx*, proceeding forth from the inner holes of the orb of the eye, for it compaſſes the eye on every ſide.

3. *Uvea*, or the Grapy Coat.

The third is called *Uvea* or Grapy Coat, becauſe in the exteriour part it repreſents the colour of 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 in 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 humour do not overwhelm the Cryſtalline. This grapy Coat is, as it were, died on the inſide with divers colours, as black, brown, blue, or green like a Rainbow, and that for theſe enſuing benefits.

Why the Grapy Coat reſembles divers colours.

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 paſs when we look through green or red Glaſs. But it muſt be coloured, that ſo it may collect the ſpirits diſſipated by the Sun and Seeing.

Table 3. Fig. 1. *Sheweth the Membrane and humors of the Eye, by lines drawn after the manner of a true Eye.*
F. 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 poſterior part of the Horny Coat, together with the ſaid Net Coat ſeparated from the Eye.*
F. 9. *The coat of the vitreous or glaſſie humor called* Hyaloides.
Fig. 10. *The humours joined together.*
Fig. 11. *The former 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 humour diſpoſed upon the Cryſtalline round about.*
Fig. 17. *The hairy proceſſes beamingly ſprinkled through the fore-ſide of the Coat of the Glaſſie humour.*
Fig. 18. *The fore-ſide of the Glaſſie humour.*
Fig. 19. *The place of the Watery humour.*
Fig. 20. *The Glaſſie humour containing or comprehending the Cryſtalline.*

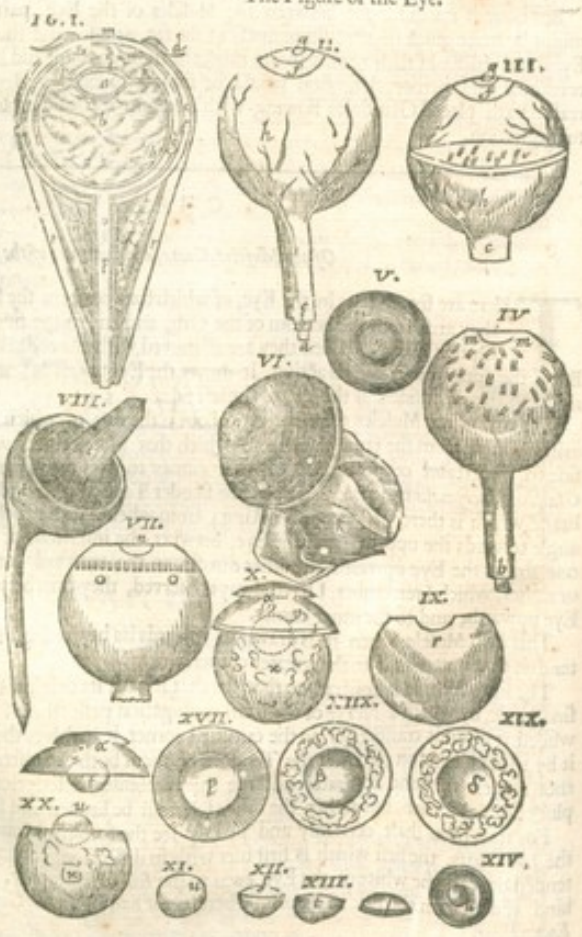
The Explication of the firſt Figure by it ſelf.

a *The Cryſtalline humour.*
b *The Glaſſie humour.*
c *The Watery humour.*
d *The utmoſt Coat called* Adnata.
e *The dark part of the Horny Tunicle, which is not tranſparent.*
f *The Grapy Coat called* Retiformis.
h *The coat of the glaſſie humour called* Hyaloides.
i *The coat of the Chryſtalline.*
k k *The hairy proceſſes, called* 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.*
n n *The fat betwixt the Muſcles.*
o *The Optick Nerve.*
p *The* Dura meninx.
q *The* Pia Mater, *or thin* Meninx.
r r *The Muſcles.*

The explication of the other 19. Fig. 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 the beap.*
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* Fig. 3. *ſheweth how the Veſſels do join the hard Membrane with the Grapy coat.*
k 6 *The horny or hard Membrane turned over.*
l l 3 4 *Certain fibers and ſtrings of Veſſels, whereby the Grapy coat is tied to the Horny.*
m m 4 5 *The impreſſion of the Grapy coat where it receedeth 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* Fig. 17. *ſheweth the Ciliar proceſſes ſprinkled through the fore-part of the Glaſſie humour,*

The Figure of the Eye.



19 The bosom or depression of the Glassie humour 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 humour, which is spherical or round.* u 11 14 20 *The fore-part of the same Crystalline depressed.* x 10 20 *The amplitude of the Glassie humour.* y 10 16 19 *The amplitude of the watery humour.* z 19 *The place where the glassie humour is distinguished from the watery, by the interposition of the* Hyaloides, *or Coat of the Glassie humour.* α 10 16 *The place where the grapy Coat swimmeth in the watery humour.* β 18 *The cavity or depression of the Glassie humour which remaineth when the Crystalline is exempted or taken from it.* δ 19 *The cavity or depression of the Watery humour made by the same means.*

Thirdly, It was convenient it should be planted with infinite variety of colours for the preservation of the sight. For as the extreme colours corrupt and weaken the sight, so the middle refresh and preserve it, more or less, as they are nearer or further remote from the extremes. It was fit it should be soft, that so it might not hurt the Crystalline humour 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 blackness, as a contrary, the great, and as it were, diffused variety of colours, no otherwise than we see the heat is strengthened 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.

Now follows the fourth Coat called *Amphiblestroides* or *Reti-formis*, 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, also of the Glassie humour which it encompasses on the back-part. The principal commodity of this Coat is, to perceive when the Crystalline humour 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 principal instrument of Seeing. It is softer then any other Coat, lest the touch of it should offend that humour. Wherein thou wilt admire the singular order of Nature, which as in other things it passes not from one extreme to another, unless by a *Medium*; so here it hath not fitted the hard horny Coat to the soft humours, 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 than these two, as the Net-like Coat is softer than it, that thus it might pass from extreme to extreme, as it were, by these degrees of hardness and softness.

4. *Amphiblestroides* or *Reti-formis*, Net-like Coat.

An Anatomical Axiom.

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 Onion which exceeds the other in clearness, whiteness, and thinness. This *Araneosa* or Cobweb-like Coat encompasses the Crystalline humour on the fore-side, peradventure that so it might defend it, as the chief instrument of Seeing, if the other humours should at any time be hurt. It hath its original from the excrementitious humidity of the Crystalline humour, hardned into that Coat by the coldness of the adjacent part; absolutely like the thin skin which encompasses the white of an Egg.

5. *Arachnoides, sive Aranosa*, the Cobweb Coat.

The first humour of the Eye is called *Aqueus*, or Waterish, from the similitude of Water; it is seated between the transparent part of the horny Coat, the portion of the Crystalline humour 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 humour, 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 humour. Peradventure it is made of the whayish humour sweating out of the Vessels of the Coats, having their orifices for the most part in that place where this waterish humour resides. The second humour and middlemost in situation is called the Crystalline, because it imitates Crystal in the brightness and colour; if so be, that we may attribute any colour to it. For indeed, it was fit, that none of the three humours 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 read written by the Philosopher, 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 humours of the Eyes without colours, Wax without any Figure, the Mind without any particular knowledge of any thing, that so they might be able to receive all manner of Forms. The figure of the Crystalline humour is round, yet somewhat flatted on the fore-side, but yet more flatted behind, that so the objects might be the better retained in that, as it were plain 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 thing falling or hitting against it, because that body which is exactly round touches not a plain body, but onely in a point or prick. Half this humour swims in the Glassie humour, that so it may be nourished from it by transposition of matter; or rather (seeing it is encompassed on every side with the fifth 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 fore-part, which lies next to the waterish humour, and the space of the Apple of the Eye.

The three humours of the Eye.

1. *Aqueus*, or Watery.

2. *Crystallinus*, or Crystalline.

A Philosophical Axiom.

Of which thing this is an argument, that as long as a man remains alive, we see the Eye every way full and swollen, 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 humour 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

Gal. cap. 5. lib. 10. de usu Part.

horny Coat at his original, that is, in the parts next the *Iris*, ſeemeth to be very nigh the Cryſtalline humour, 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 Anatomical diſſection, and the operation of touching or taking away a Catarrhact: for whereas a Catarrhact is ſeated between the horny Coat and Cryſtalline humour, 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-glaſs to the faculty of Seeing carried thither with the viſive ſpirit.

In what place a Catarrhact or a Suffuſion breeds.

3. *Vitreus ſiu Albugineus*, that is Glaſſie, or like the white of an Egg.

The third and laſt humour is the *Vitreus*, the Glaſſie, or rather Albugineous humour; called ſo, becauſe it is like molten Glaſs, or the white of an Egg. It is ſeated in the hind-part of the Cryſtalline humour, 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 watery humour is placed on the fore-ſide of the Cryſtalline to hinder the violence of the light and colours entering that way. This Glaſſie humour is nouriſhed by the Net-like Coat.

The Veins of the Eye.

We have formerly ſpoken ſufficiently of the Nerves of the Eye: Wherefore it remains that we ſpeak of the Veins. Some of theſe are internal, carried thither with the Coats of the Veſſels of the Brain; otherſome external ſtretched over the external parts of the Eye, as the Muſcles and Coat *Adnata*; and by theſe Veins inflammations and redneſs often happen in the external parts of the Eye: for which the *Vena pupis* muſt be opened, and Cupping-glaſſes and Horns muſt be applied to the nape of the Neck and ſhoulders: as, in the internal inflammations of the Eye, the Cephalick-Vein muſt be opened to avert and evacuate the morbifick humour.

What Veins may be opened in what inflammations of the Eyes.

CHAP. VII.

Of the Noſe.

THe Noſe is called in Greek *Rin*, becauſe the excrements of the Brain flow forth by this paſſage; thou muſt underſtand it hath divers ſubſtances by compoſition. The quantity, figure and ſite are ſufficiently known to all. But it is compoſed of the Skin and Muſcles, Bones, Griſles, 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 Griſles of the Noſe are ſix in number; the firſt is double, ſeparating both the noſtrils in the top of the Noſe extended even to the Bone *Ethmoides*. The ſecond lies 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 Griſles is, that the Noſe moveable about the end thereof, ſhould be leſs obnoxious to external 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 Griſles 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 Internal going on the inner ſide from the Jaw-bone, ends at the beginning of the Griſles that make the Wings, that ſo it may contract them. The Coat which inwardly inveſts the Noſtrils and their paſſages, is produced by the Sive-like Bones from the *Craſſa meninx*, as the inner Coat of the Palat, Throttle, Weazon, Gullet, and inner Ventricle; that it is no marvail, 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 Conjugation, through the hole which deſcends to the Noſe by the great corner of the Eye.

The Noſe in all 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 mammillary proceſſes being the paſſages of the Air and Smells 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 grilly 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 animal ſpirit. The two holes of the Noſe at the 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. But the Noſe was parted into two paſſages, as we ſee, not onely for the forementioned cauſe, but alſo for helping the reſpiration and vindicating the Smell from external injuries; and laſtly, for the ornament of the Face.

The temper, action, and uſe.

Why the Noſe was parted in two.

CHAP. VIII.

Of the Muſcles of the Face.

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 Yoke-bone, deſcends by the cor-

Their number

ner

ner 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 internal inwards towards the Teeth.

The first of the lower lip being the longer and slenderer, entering out of that region which is between the external 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 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 internal and external 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 other some 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.

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 these four Muscles which shut the Jaw is called *Crotaphita* or Temporal 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 yoke-bone, from whence it inserts it self to the process of the lower Jaw, which the *Greeks* call *Corone*, that it may draw it directly to the upper, so to shut the Mouth. Their number. The Temporal Muscle.

But you must note that this Muscle is tendinous even to his Belly, and that it fills 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 near their original, that is, the Brain, they infer the danger of sudden death by a Convulsion, which usually follows the affects of this Muscle, but also in like manner it causes a Fever, the Phrensie and *Coma*. Why the wounds of the Temporal Muscle are deadly.

The Figure of the chief Muscles of the Face.

FIG. II.

A *The Muscle of the Fore-head and the right Fibers thereof.*
B *The Temporal Muscle.*
α β γ *His semicircular original.*
D *The Muscle of the upper lip.*
G *The Yoke-bone under which the Temporal Muscles pass.*
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 Jaw 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 pass which go to the Head, and the Nerves which are sent to the Arm.*

Therefore that it should be less subject or obvious to external 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 equal 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 Yoke-bone) and inserts it self into the lower Jaw, from the corner thereof to the end of the root of the process *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 Yoke-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 proceſs *Coronæ*, that ſo they might draw it back: Truly by reaſon of theſe contrary motions, it is likely this Muſcle was called the *Maſſeter*, or Grinder.

The Round Muſcle.

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 then any other Muſcle. The action thereof is, not onely to draw the lower Jaw to the upper, but alſo as with a ſhovel to bring the meat diſperſed over all the Mouth under the Teeth, no otherwiſe than the Tongue draws it in.

The leſſer Muſcle of the lower Jaw.

The fourth being ſhorter and leſs than the reſt ariſing from all the hollowneſs of the winged proceſs 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 Figure of the Muſcles of the lower Jaw.

FIG. III.

A *A hole in the fore-head bone in the brim of the ſeat of the Eye, ſending a ſmall Nerve of the third pair to the Muſcles of the fore-head and the upper eye-brow.*

B *The temporal Muſcle.*

The fifth and laſt Muſcle.

The fifth and laſt Muſcle of the lower Jaw is from the proceſs *Styloides* of the Stony bone, aſcends to the fore-part of the Chin, near to the connexon of the two bones of this Jaw, 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 ſtronger, but it is fleſhy at the ends.

The uſe of theſe mentioned Muſcles.

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.

CHAP. X.

Of the Ears *and* Parotides, *or Kernels of the* Ears.

The nature and compoſition of the ears.

THe Ears are the Organs of the ſenſe of Hearing. They are compoſed of the skin, a little fleſh, a griſle, veins, arteries, and nerves. They may be bended or folded in without harm, becauſe being griſly, they eaſily yield 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 nearer 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.

What the *Fibra* and *Pinna* are.

The figure and reaſon thereof.

This Membrane which is indifferently hard, hath grown up from the Nerves of the 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 Bells. Otherwiſe alſo, leſt that the air too ſuddenly entering, 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 ſtaid in theſe windings and turnings of the ways, 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 thereof. 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 proceſs and *foramen cæcum*, that ſmitten upon by the touch of the external air entering in, it may receive the object, that is, the ſound, which is nothing elſe than a certain quality ariſing from the Air, beaten or moved by the collifion and conflict of one or more bodies.

For what uſe the membrane ſtretched under the Auditory paſſage ſerves.

What ſound is

Such a collifion 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 Rivulets running in a narrow Channel, the Water ſtrucken, and as it were, beaten back in its courſe againſt broken, craggy and ſteep Rocks,

Rocks, wheels about into many turnings: this collision of the beaten air flying back divers ways from arched and hollow-roofed places, as Dens, Ciſterns, Wells, thick Woods, and the like, yields 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 two-fold, that is, External and Internal. The cauſe of an echo.

The Figure of the Ears and Bones of the Auditory paſſage.

Tab. 10. *Sheweth the Ears and the divers internal parts thereof.*

Fig. 1. *Sheweth the whole external 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 near 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 Calf, both joined and ſeparated.*
Fig. 9. *Sheweth the Muſcle found out by* Aquapendens.

For the particular Declaration ſee *Dr. Crooke Anatomy*, pag. 577.

The exteriour is that which encompaſſes us, but the interiour is that which is ſhut up in the cavity of the mamillary proceſs and *foramen cæcum*, 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 in ſtead of the 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 Anvil, 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 three bones of the auditory paſſage.

They are placed behind the Membrane; wherefore the Anvil and Hammer moved by the force of the entrance of the external air, and beating thereof againſt that Membrane, they more diſtinctly expreſs 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 diverſe agitation, they produce divers and different ſounds. Their uſe. 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 lie 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 dried by their continual motion. Their other conditions and uſes are formerly handled in our firſt Book of Anatomy.

CHAP.

CHAP. XI.

Of the Bone Hyoides, *and the Muſcles thereof.*

The reaſon of the name. 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 ὑοειδὲς ; And from the Letter λ it is in like ſort called λαμβδοειδὲς ; by ſome it is ſtiled *os Gutturis*,

The compoſition. 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 Griſles.

The ſite. This Bone is bigger in Beaſts and compoſed of more Bones, and that not onely by the intercourſe of Griſles, but alſo of Ligaments. It is ſeated with its baſis (being gibbous on the fore-part for conſtancy, and arched on the inſide that it might receive and contain the root of the Tongue) upon the upper part of that Griſle of the Throttle, 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 tied to the Appendix *Styloides* by Ligaments ſent from it ſelf. Contrary than it is in Beaſts, who have it of many Bones; united, as we ſaid, by the intercourſe of Ligaments even to the

The temper and uſe. root of the *Styloides*. Wherefore this Bone hath connexion with the fore-mentioned parts, and other hereafter to be mentioned. It hath the ſame temper as 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 Throttle, as to its own, of which we will now treat.

The Muſcles of the bone *Hyoides.* The Muſcles of the Bone *Hyoides*, according to the opinion of ſome, are eight, one each ſide four; of which there be two, one of which *Galen* refers to the common Muſcles of the *Larinx* or Throttle; 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, unleſs 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 near 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 referred 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 Throttle, as it is in Beaſts. The

The action of theſe Muſcles. 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.

CHAP. XII.

Of the Tongue.

What kind of fleſh the Tongue hath. THE Tongue is of a fleſhy, rare, looſe, and ſoft ſubſtance; it enjoys fleſh of a different kind from the reſt of the fleſh, as chiefly appears when you cut it from the firſt original 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 Bowels.

The quantity. The quantity thereof is ſuch, that it may be contained in the Mouth, and eaſily moved to each part

The figure. thereof. The Figure of it is triangular, which it rather expreſſes in the baſis, which is at the root of the Bone *Hyoides*, than in its point, or fore-part, where from a triangle it becomes more dilated.

Compoſure. It is compoſed of a Membrane (which it hath from that which lines all the inſide of the Mouth,)

The Nerves. Muſcles four, 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, onely give to judge 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 external 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 Throttle; they commonly term theſe the *Venæ nigræ*, or black Veins.

The Muſcles of the Tongue. 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 Co-partner draws it upwards. The ſecond hath its original 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 Tongue, 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, paſſeth 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 fifth 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

it may move it to the sides of the 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 fungous and spongy, that by reason of the rarity of it, it might more easily admit the tastes conjoined with the spettle as a vehicle. Another to be an instrument to distinguish the voice by articulate speech, for which it was made moveable 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 drie, 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 Fever: 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 watrish and spettely humour, with which they humect and make more glib, not onely the Tongue, but also the other parts of the Mouth, as the Throat and Jaws; these glandules are called the *Tonsillæ*, 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. XIII.

Of the Mouth.

THe Mouth is that capacity, which, bounded with the Cheeks and Lips contains within its Precincts the Teeth, Tongue, and the beginning of the Throttle 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, Jaws, Tongue, Almonds, and passages of the Palat coming from the Nose, yet it remains that we declare what the Palate, the *Gargareon* or Uvula, 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 wrinkles, 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 Palate 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 Palate, 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 Wedg-bone 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 may judge of Tastes; 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 Grisle, it would have been without sense; but if softer, hard, acid 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. XIV.

Of the Gargareon, *or Uvula.*

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 Throttle. 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 quill 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 onely their Voice 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 patricle 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 Throttle 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 Throttle, and the meat into the Gullet.

What the *Gargareon* or Uvula is.

The site and manifold use thereof.

The discommodities that ensue the loss of the Uvula.

What the *Pharinx* and *Fauces* are.

CHAP. XV.

Of the Larinx, *or Throttle.*

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 and extremity of the rough Artery, or Weazon, which comes nearer to grisly substance, than to any other. The quantity thereof is sufficiently large, yet

What is meant by the *Larinx*.

The magnitude, figure, and compoſure.

yet diverſe according to the diverſity of bodies. It reſembles in ſhape the head of a *German* 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 Griſles, Veins, Arteries, and Nerves, as we ſhewed when we ſpoke of the diſtribution of the Veſſels; as alſo of a double Coat, the one external, the other internal, as we ſhewed when we ſpoke of the Weazon. Theſe three Griſles are joined together by certain Ligaments and Muſcles; the foremoſt Griſle, 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 Griſle. The laſt and leaſt, which notwithſtanding may be parted into two, ſo lies upon the edges of the other, that it reſembles the mouth of an Oil-pot, or a Pitcher, whereupon the *Greeks* call it *Arytenoides*. Theſe Griſles 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 yield a heavy or dull ſound; when they are ſhut or drawn together, a quick or ſharp ſound; and to conclude, they make it infinite ways different according to the infinite variety of the dilatation, or conſtriction thereof. Therefore, becauſe it was fit theſe Griſles ſhould be moveable, eſpecially the *Arytenoides* and *Thyroides*, Nature hath put to them on each ſide nine 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 Griſle, 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 Griſle, 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 ſtraitly 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-evil, 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 *Vertebraes* of the Neck lying tranſverſly upon the ſides of the Gullet, and ends at the wings and ſides at the ſhield-like Griſle, that it may tie it more ſtraitly to the ſecond Griſle. But theſe three are called common Muſcles, becauſe they take their original 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 Griſle, makes a circle under the baſis of the ſhield-like Griſle; whileſt 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 Griſle, from that place where it adheres to the firſt, it runs obliquely croſſing the firſt to the inner and forepart of the Griſle *Thyroides* near to the baſis thereof, that it may join it to the ſecond. The third from the hind-baſis of the ſecond Griſle aſcends directly to the baſis of the third Griſle *Arytenoides*, that with the ſecond Muſcle it may open and ſhut it. The fourth aſcends from the ſides of the ſecond Griſle, near the original of the ſecond Muſcle, to the ſides of the *Arytenoides*, that with the ſecond Muſcle it may open and ſhut it. The fifth ariſes from the inner middle of the ſhield-griſle, and ends in the fore-part of the *Arytenoides* at the inſertion of the fourth Muſcle, that ſo it may preſs down the ſaid Griſle.

The deſcription of the three Griſles 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 ſixth 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 Griſle *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 organical parts, by reaſon of the diverſity of their compoſition. Wherefore henceforward 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 organical are compoſed; as if any ſhould ask, of what temper the *Larinx* is, you ſhall anſwer, of a cold, dry, hot, and moiſt, becauſe it conſiſts both of a griſly and fleſhy ſubſtance. He which reckons up all the parts of the Mouth, muſt not omit that griſly 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 principal 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 griſles of the Throttle, but eſpecially the *Arytenoides*; it is always moiſt by a certain Native and Inbred Humidity; wherefore, if it happen to be dried by a Fever, 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 muſt not think that this body doth ſo cloſely ſhut the orifice of the Throttle, but that ſome ſmall quantity of moiſture always runs down by the inner ſides, as the walls thereof, to moiſten the Lungs; otherwiſe *Eclegmaes* 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

The *Epiglottis*, or After-Tongue.

Of potable things ſomewhat always falls upon the Lungs.

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 Griſle thereof. Truly I could never obſerve and find theſe four Muſcles in a man, though I have diligently and earneſtly ſought for them, but I have always 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 heavineſs of ſuch things as are to be ſwallowed; but that at all other times by reaſon of the continual breathing it ſtands upright, the Throttle being open. There remain as yet to be conſidered, two ſmall boſoms 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 ſtaid and retained. Beſide that, the Air too violently entering, ſhould be in ſome ſort broken by theſe cliſts or chinks, no otherwiſe then the blood and ſpirit entering into the heart through the *Auriculæ*, or Ears thereof.

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 *Vertebræ* 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 than a part of the Head, which is contained between the Nowl-bone and the firſt *Vertebra* of the back. First in the Neck, the *Vertebræ* 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 original 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 Spinal-marrow paſſes; thirdly, the *Apophyſes* or proceſſes of the *Vertebræ*; fourthly, the holes through which the Nerves are diſſeminated into other parts from the Spinal 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 fore-part thereof upon which the Gullet lies. For the hole, that is not always the largeſt in thoſe *Vertebræ* which are higheſt the Head; but it is always 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 thoſe 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 by which theſe Rack-bones are mutually knit together by *Ginglymos*; theſe are ſeated between the 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 entering the Spinal 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 Spinal marrow to the outward parts, are under the tranſverſe proceſs, that is growing or made by the upper and lower *Vertebra*, contrary to all other which are in the reſt of the Rack-bones. For the connexion of the Rack-bone, you muſt know, that all the *Vertebræ* of the Spine have ſix connexions, two in their own bodies, and four in their oblique proceſſes. By the two firſt connexions they are ſo mutually articulated in their own bodies, that each are joined with other both above and below. But by the four other by their oblique aſcendent and 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 always 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 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 fifth 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 its ſides of the body, and it is made very thin on the fore-ſide, 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 principal Ligament of the Head is faſtned, which deſcends within from the hind-part of the Head under the *Apophyſes Clinoides*, or proceſſes of the Wedge-bone.

What the Neck is.

What to be conſidered in the *Vertebræ* of the Neck.

Which be the right proceſſes of the *Vertebræ*.

Which the Oblique.

Which the Tranſverſe.

The connexions of the *Vertebræ* of the Neck.

The Proceſs called the Tooth.

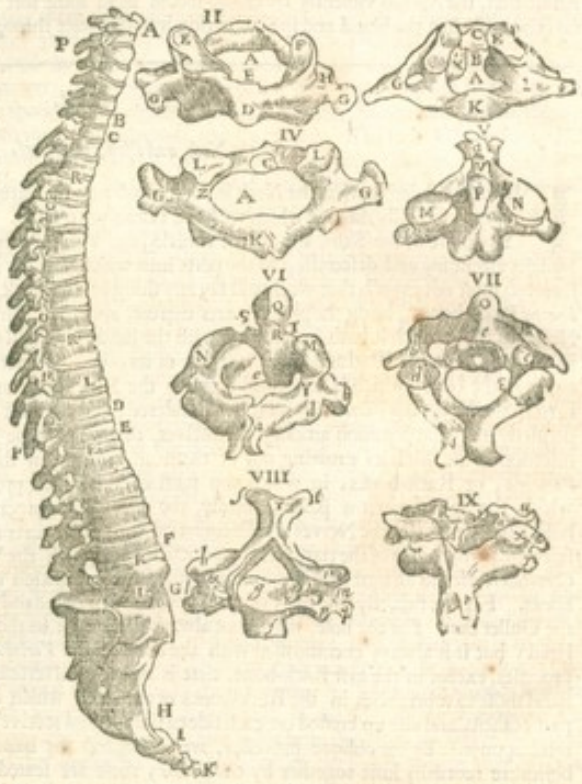
And

By what artiſtation the head is bended backwards and forwards.

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 external, 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 encompaſſes the articulation mixing it ſelf with the Griſle, 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 Rack-bone is tied together, and compoſed throughout with ſuch Ligaments.

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 Dr. *Crook*, p. 398.

FIG. I



From A *to* B *the ſeven* Vertebraes *of the Neck.*
From C *to* D *the twelve* Vertebraes *of the Cheſt.*
From E *to* F *the five Rack-bones of the Loins.*
From G *to* H *the* Os ſacrum, *or Holy Bone conſiſting, commonly, of ſix* Vertebræ.
From I *to* K *the Bone* Coccyx, *or the Rump-bone, according to the late Writers.*
L L *The bodies of the* Vertebræ.
M *The Tranſverſe proceſſes of the* Vertebræ.
N *The deſcendent proceſſes.*
O O *The aſcendent proceſſes.*
P P *The backward proceſſes.*
Q Q *The holes that are in the ſides of the* Vertebræ, *through which the Nerves are tranſmitted.*
R R *A griſly 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 Griſle.*
D 2 *A prominence in the outward region of the* Sinus.
E F 2 3 *The* Sinus, *or cavity of the firſt Rack-bone which admitteth the two heads of the Newl-bone.*
G G 2 3 4 *The tranſverſe proceſs of the firſt* Vertebra. H 1 *The hole of this tranſverſe proceſs.* I 3 *The* Sinus *which together with the cavity of the Newl-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.* L L 4 *Two cavities of the firſt Rack receiving the two bunches of the ſecond Rack marked with* M N. M N 5 6 *The two 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 Griſle.* Q 6 *The back ſide of the Tooth.* R 6 *The* Sinus *or cavity of the ſame, about which a tranſverſe Ligament is rouled, containing the ſaid Tooth in the cavity of the firſt Rack.* S T 6 *Certain cavities at the ſides of the Tooth whence the roots iſſue of the fore-branch of the ſecond pair of ſinews.* V 5 *The point of 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 ſixth Figure.* e 6 7 *The place where the body of the ſecond Rack deſcendeth downward.* f g g 8 *The lower ſide of the body of the third Rack at* f, *the two eminent parts of the ſame at* g g. h i 8 *The aſcending proceſſes.* l m 8 *The two deſcending proceſſes.* n o p q 8 *The tranſverſe proceſſes.* r 8 9 *The Spine or backward proceſs.* ſ t 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.*

The *Vertebræ* of the Holy-bone.

The Holy-bone is compoſed of four *Vertebræ* (or rather of five or ſix, as in the Figure above) 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 be bigger than that which is ſupported. There is a certain moiſture, tough and fatty, put between the Rack-bones, as alſo in other joints to make them glib and ſlippery, that ſo they may the better move. Whileſt this motion is made, the Rack-bones part one from another.

The

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 Carcaſs 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 lie 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 Back-bone.

Therefore a Ligament is nothing elſe than a ſimple part of Mans Body, next to a Bone and Griſle the moſt terreſtrial, 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 bloud, 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 general, for every part of the body, which ties 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 *Peritonæum* comprehending all the natural parts, and binding them to the Back-bone: ſo the Membrane inveſting the Ribs, (that is, the *Pleura*) containing all the Vital 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 that part of the Body which we have deſcribed a little before. What parts may be called Ligaments in a general ſignification.

The differences of Ligaments are many, for ſome are membranous and thin; others broad, other-ſome thick and round, ſome hard, ſome ſoft, ſome great, ſome little, ſome wholly griſly, others of a middle conſiſtence between a Bone and Griſle, according to the nature of the motion of the parts which they bind together in quickneſs, vehemency, and flowneſs. We will ſhew the other differences of Ligaments, as they ſhall preſent themſelves in diſſection. The differences of Ligaments properly ſo called.

CHAP. XVII.

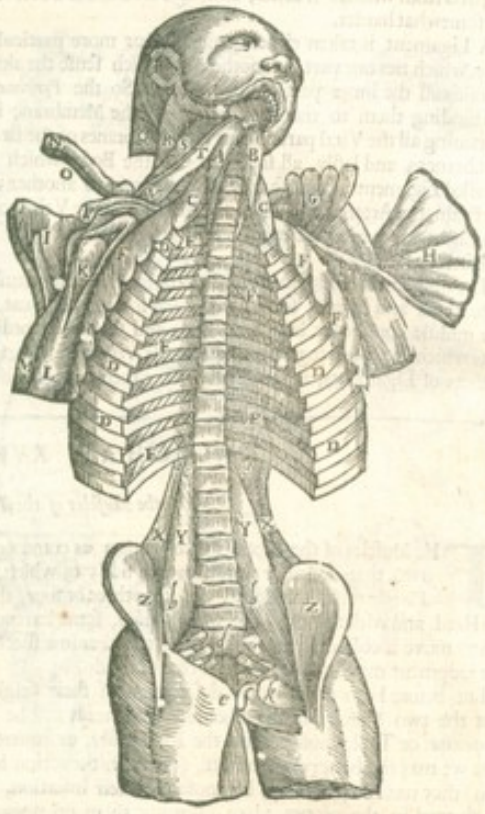
Of the Muſcles of the Neck.

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 onely 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. Their number

But before I can come to the deſcription of their original and inſertion, I muſt admoniſh thee, that the two Muſcles of the Shoulder-blade muſt firſt be taken away by diſſection; that is, the *Trapezius* or Table-muſcle, and the *Rhomboides*, or Square-muſcle; whoſe original and inſertion that we may the better demonſtrate, (or rather the action by which we ſeek that original 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 original, 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 original, 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 to the hind and upper angle of the Shoulder-blade, as ſhall be ſhewed in fit place hereafter. Theſe Muſcles thus raiſed up, the four Muſcles which erect 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 Anatomical 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 four which lift up and extend the Head, the firſt from the figure of the Spleen is called the *Splenius*, it aſcends from the five upper ſpines of the Back, and the four 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 original. 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, encompaſſing the lower and ſide-part of the Neck, you may eaſily take it up, if you begin at the ſpine, and ſo go forward 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 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, onely moving the head, theſe truly muſt not be plucked from the places of their original, nor inſertion, but onely bound by a firing put under them, that ſo they may be the more eaſily ſhewed. On each ſide follow two oblique Muſcles, one whereof onely moves the Head; the other primarily the firſt *Vertebra*, but ſecondarily and by accident the Head it ſelf. For the firſt, contrary to the The *Splenius*. The *Complexus*. The *Recti*, or two right Muſcles.

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 entering forth of the Spine of the ſecond *Vertebra*, is inſerted at the proceſs of the firſt, contrary to the original of the precedent, although ſome think otherwiſe. It will be convenient in the like manner, onely to lift up this with a ſtring, and not pluck him from its 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 original and inſertion ſhew.

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.
C C *The ſecond bender of the neck, called* Scalenus.
D D D D *The outward* intercoſtal *Muſcles.*
E E E E *The inner* intercoſtal *Muſcles.*
F F F *The ſecond Muſcle of the Cheſt, called* ſerratus major.
G *The firſt Muſcle of the Shoulder-blade, called* ſerratus minor, *ſeparated from his original.*
H *The firſt Muſcle of the Arm called* Pectoralis, *ſeparated from his original.*
I *The ſecond Muſcle of the Arm, called* Deltoides.
K *The Bone of the Arm without fleſh.*
L *The firſt Muſcle of the Cubit, called* Biceps.
M *The ſecond Muſcle of the Cubit called* Brachicus.
N *The Clavicle, or Collar-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.
T V *The two Bellies of the fourth Muſcle of the bone* Hyois. X X a a *The fifth Muſcle of the back whoſe original is at* a a. Y Y b b c c *The ſixth Muſcle of the Thigh, called* Pſoæ, *whoſe original is at* c c, *and tendon at* b b. Z Z *The ſeventh Muſcle of the thigh.* d *The Holy-bone.* o o o *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 nineth Muſcle of the thigh or the firſt* circumactor.

Which may be truly called the proper Muſcle of the Neck.

Wherefore when the firſt oblique moves the Head obliquely forward, the ſecond pulls 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 *Galen*'s 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 *Galen*'s 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 later Anatomiſts, who teach that the Head cannot be turned round, or circularly upon the firſt *Vertebra*, without putting it out of joint.

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 original rather into two, than into three Muſcles. But it had been better that the Head might have been moved every way, equally 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 looſeneſs 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 lax or looſe, but ſtiff and ſtrong.

After

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 ways; 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 original 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 process thereof; some 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*.

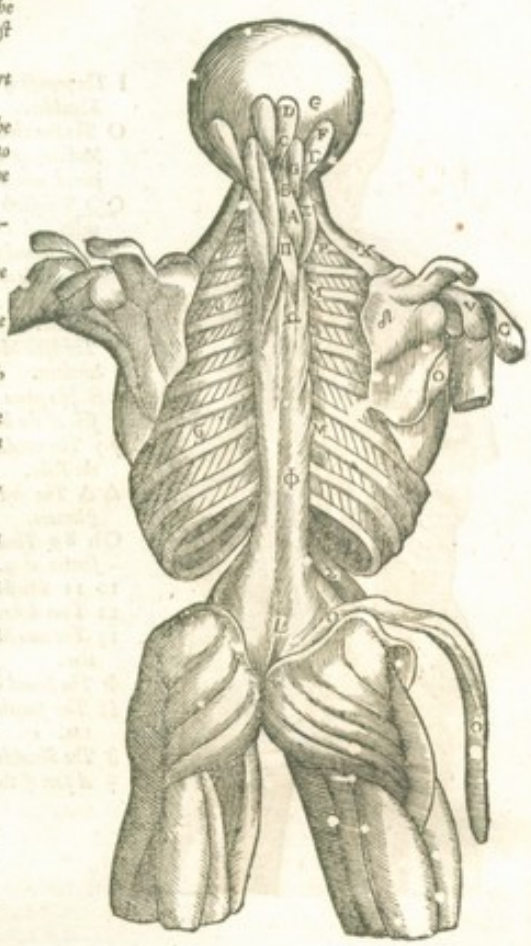
The Fifth Figure of the Muscles. In which some Muscles of the Head, Chest, Arms, and Shoulder-blade are described.

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 sixth Muscle of the Arm, or the upper* Blade-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 fifth Muscle of the Chest, or Muscle called* Sacro-lumbus.
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 is 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.*
Φ *The second Muscle of the back, or the* Longest *Muscle.*
Ω *The fourth Muscle of the Back, or the* Semi-spinatus.
δ *The Shoulder-blade bare.*
ρ *A part of the transverse Muscle of the* Abdomen.

Marvel not if you find not this distinction of their original 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 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 original, 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 onely 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 *Vertebræ*. But it seems with its co-partner 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 it 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 *Spinatus*. The *Longus*. The *Scalenus*.

the Veins and Arteries pertaining to the Neck, they have been declared in the proper Chapters of the diſtribution of the Veſſels; it remains that you note, All theſe Muſcles receive Nerves from the *Vertebræ*, whence they ariſe.

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 fourth part of the ſecond.*

G G *(Betwixt the Ribs) the external* intercoſtal *muſcles.*

L *The original of the two muſcles of the Back.*

M *His tendons at the Back-bone of the neck.*

The upper O, *the fourth muſcle of the Arm, or the* greater round *muſcle.*

O O *the lower*, *The ſixth muſcle of the Cheſt, or the* Sacrolumbus *hanging from his original.*

Q *The ſixth muſcle of the Arm or the upper* Blade-rider *inverted.*

V *The third ligament of the joint of the Arm.*

X *The fourth muſcle of the Shoulder-blade or the* Heaver.

Z *The ſecond muſcle of the Cheſt, or the* greater Saw-muſcle.

Ξ *The three muſcles of the neck called* Tranſverſalis.

Π *The Fourth muſcle of the neck called* Spinatus.

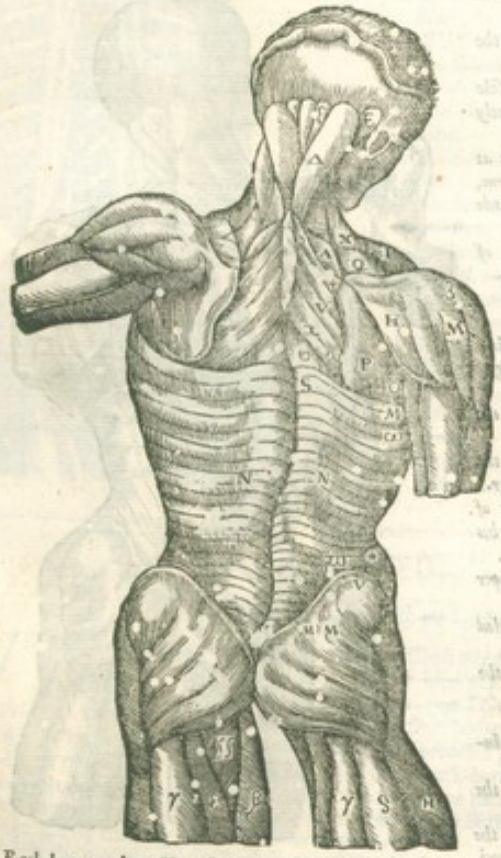
Σ *The firſt muſcle of the Back, or the* Square muſcle.

Φ *The two muſcles of the Back, or the* Longeſt; *whoſe original is at* L, *and his tendons at the* Vertebræ *at* M M.

Ω *The fourth muſcle of the back called* Spinatus.

δ *The back of the Shoulder-blade flayed.*

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 muſcle of the head, called* Complexus.

I *The Coller bone bared.*

M *The back-part of the ſecond Muſcle of the Arm called* Deltois.

ξ H *His backward original.*

ϐ *His implantation into the Arm.*

N N *The fourth muſcle of the Arm called* Latiſſimus.

S μ *His original from the Spines of the Rack-bones, and from the holy-bone.*

π *The connexion of this Muſcle with the Haunch-bone, which is led in the inſide from* μ *to* π.

ω *The place where it lieth upon the lower angle of the Baſis of the Shoulder-blade.*

O *The four Muſcles of the Arm, called* Rotundus major.

c *Some Muſcles of the Back do here offer themſelves.*

P *The fifth Muſcle of the Arm, called* Super-ſcapularis inferior.

Q *The ſixth Muſcle of the Arm called* Super-ſcapularis Superior.

S *The beginning of the third Muſcle of the Arm called* Latiſſimus.

V *The third muſcle of the Blade called* Rhomboides.

φ X *His original from the Spines of the Rack-bones.*

ϟ 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.

The Eighth 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 binder Saw-muſcle.*

B *The five Muſcles of the Cheſt, or the lower and binder Saw-muſcle.*

ab *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 original is from the neck of the Arm, and from the lower Baſis of the Blade at* d.

E *The Original of the fourth Muſcle of the Bone* Hyois *from the Blade.*

G G *The Outward Intercoſtal Muſcles.*

I *The Clavicle or Collar-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 the Arm or the lower* Super-ſcapularis, *or blade-rider.*

1 2 3 *Char. his original at the Baſis of the Shoulder-blade at* 12, *and his inſertion into the joint of the Arm at* 3.

Q *The ſixth 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.*

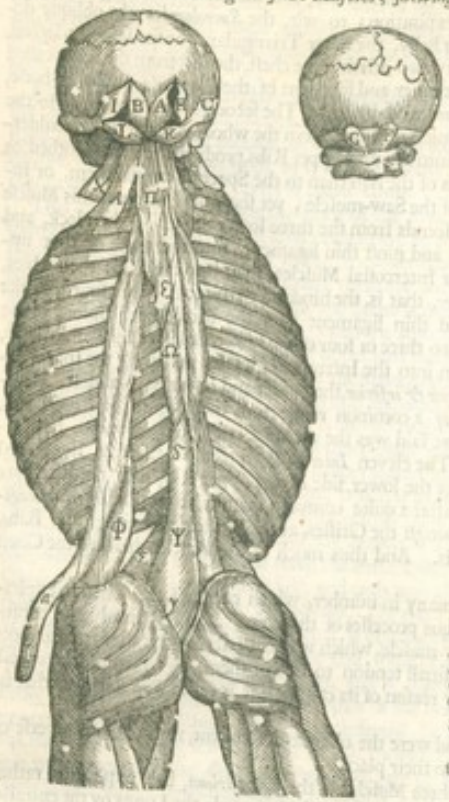
F *The ſixth Muſcle of the Cheſt, or the Muſcle called* Sacrolumbus.

E Λ *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* Semi-ſpinatus.

The Nineth 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 Mammillary proceſs.*
D *The tranſverſe proceſs of the firſt Rack-bone.*
E *The proceſs of the ſecond Rack-bone of the Neck.*
F G *The fourth pair of Muſcles of the Head, called* Recti Minores.
H I *The fifth pair of Muſcles of the Head, called* Obliqui Superiores.
K L *The ſixth 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* Fallopius *maketh the eighth Muſcle of the Cheſt.*
Π *The fourth Muſcle of the Neck, called* Spinatus.
Σ *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 Original.*
+ *The third Muſcle of the Back, called* Sacer.
γ *His Original.*
δ *His End.*
Ω *The fourth Muſcle of the Back, called* Semiſpinatus.
t *His upper end under the fourth Muſcle of the Neck.*

CHAP. XVIII.

Of the Muſcles of the Cheſt and Loins.

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 *Metathorenum*, 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 Rack-bones 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 Spinal-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. In what the *Vertebræ* of the Neck and Loins agree and diſagree.

Concerning the proceſſes of the Rack-bones 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 onely 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 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 are wont to be received. They differ beſides from all the fore-mentioned, by reaſon of their Spines, becauſe from the eleventh they by little and little do look upwards, contrary to the former.

But if any ask how the tenth *Vertebra* of the Back may be termed the midſt of the Spine, ſeeing 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 grilly than bony) be numbered 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. How the tenth *Vertebra* of the Back, may be ſaid to be the middle of the Spine.

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 Midriff. Of theſe forty four, there are twenty two which dilate the Cheſt in drawing in the breath; that is, the *Subclavius*, The number of the Muſcles of the Cheſt. The Muſcles dilating the Cheſt.

clavius, 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 ſix *Intercartilaginei externi*. On the contrary, as many contract the Breſt in expiration; to wit, the *Sacrolumbus*, the oblique deſcendent, the Right and Tranſverſe of the lower Belly, the inner Triangular, 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 fore-part of the *Clavicula* or Coller-bone, into the Griſle 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 Intercoſtal 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 Intercoſtal Muſcles, than into the Ribs themſelves, whereupon it is called *Serratus poſterior & ſuperior*, that is, the hinder 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 Intercoſtal 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 external Intercoſtal muſcles deſcend obliquely from the back part of the lower ſide of the upper Rib, into the fore part of the upper ſide of the Rib lying next under, after a quite contrary manner to the ſix *Intercartilaginei*, who having like original and inſertion amongſt the Griſles, as the Intercoſtal amongſt the Ribs, deſcend obliquely from the fore-part backwards. And thus much of the Muſcles dilating the Cheſt in inſpiration.

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.*

Six 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 Loins, 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 original, it is called *Sacrolumbus*, that is, the Holy-loin-Muſcle.

The *Sacrolumbus* the firſt of thoſe which contract the Cheſt.

The oblique deſcendent, the right and tranſverſe of the *Epigaſtrium.*

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.

Triangulus Muſculus.

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 original. The fifth, which we call the *Triangulus*, or Triangular, may be called the *Compreſſor* of the Griſles, which proceeding from the inner-ſides of the *Sternon*, goes to all the Griſles 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 internal Intercoſtal Muſcles, in my judgment, they ariſe, from the lower ſides of the upper Rib, and deſcending obliquely from the fore-part 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 external *Intercartilaginei*; as the ſix Internal *Intercartilaginei*, follow the ſite of the external Intercoſtal, proceeding from behind forwards; wherefore as well the Intercoſtal, as the *Intercartilaginei*, every where interſect each other, after the ſimilitude of the Letter X. I know ſome have written that the Internal Muſcles (whether Intercoſtal or *Intercartilaginei*) aſcend from the upper ſide of the lower Rib, forwards and backwards.

Intercoſtales interni.

Intercartilaginei interni.

Muſcles always receive their Nerves in their heads.

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 always goes under the Rib, and not above it,

The Midriff.

The laſt Muſcle of the Cheſt, that is, the *Diaphragma*, or Midriff, is ſufficiently deſcribed before; wherefore it remains, we deſcribe the Muſcles of the Loins. Theſe are ſix in number, on each ſide three, equal 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 haunch-bone into the tranſverſe proceſſes of the loins, and the laſt of the Cheſt, on the in-ſide, 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 *Semi-ſpinatus*, becauſe even to the middle of its body it takes the original 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 original from the Holy-bone, or the ſides thereof; it aſcends with its oblique Fibers to the Spines of the Loins, and of the eleven lower Rack-bones of the Cheſt.

The Muſcles of the Loins. They are three pair.

Triangulus.

Semi-ſpinatus.

Sacer.

CHAP. XIX.

Of the Muſcles of the Shoulder-blade.

NOw we muſt deſcribe the Muſcles of the extreme parts, and firſt of the Arm, taking our beginning from thoſe 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. There-

Therefore the Blade-bone on that part which lies next unto the Ribs is somewhat hollowed; wherefore on the other side it somewhat bunches 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 process *Coracoides* which this Rib produces in the end thereof: By the lower, the under-side which lies towards the lower belly and the short Ribs. The description of the Blade-bone, or Shoulder-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 Grisles which there fastned, encompass that cavity. This kind of cavity is called *Glene*. The Basis of the Blades. The head of the Shoulder-blade.

This receives and contains the Bone of the Arm by a certain strong ligament encompassing and strengthening 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 beside this, which encompass and strengthen this articulation. By the Spine is meant a process, which arising by little and little upon the gibbous part of the blade, from the *basis* thereof where it was low and depress, becomes higher until 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 strengthening of the articulation of the Arm and Shoulder-blade, that is, lest the Arm should be easily strained upward or forwards; besides, it is fastned to the clavicle by the process *Acromion*. The Spine of the Blade. The processes *Acromion* and *Coracoides*.

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 fore-part, ascends from the bones of five or six of the upper Ribs to the *Coracoides*, which it draws forwards, and is called *Serratus minor, i.e.* the lesser Saw-muscle; which that you may plainly shew, it is fit you pull the pectoral 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 original 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 grisly *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 original, 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 Muscle thereof, even to the midst of the 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 three-fold action, by reason of its triple original. The first is to draw the Shoulder-blade towards its original, that is, to the Nowl and Spine of the Neck; the other is to draw it towards the Back, because of the contraction of the middle or transverse Fibers, which lead it directly thither; and the other to draw it downwards by reason of the original it hath from the fifth, sixth, seventh, and eighth Spine of the *Vertebræ* of the Chest. The Muscles of the Shoulder-blade. *Serratus minor.* *Rhomboides.* *Levator.* *Trapezius.*

But we must note that these divers actions are not performed by this Muscle, by the assistance of one onely Nerve, but by more, which come into it by the Spinal 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.*

The other, named the *Pectoralis*, comes from the *Sternon* and Collar-bone to the Shoulder-blade and Arm. *Pectoralis.*

CHAP. XX.

The description of the Hand taken in general.

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, unless 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 ways, that is, generally and specially.

The Hand generally taken, signifies all that which is contained from the joining of the Arm to the Shoulder-blade, even to the ends of the fingers. But in particular it signifies onely that which is comprehended from the furthest bones of the cubit, or the beginning of the wrist, to the very fingers ends. What is meant by the Hand in general.

Therefore the hand in general 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 onely organical parts, but also parts of organical 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, Grisles and Ligaments: all which we will describe in their order.

But

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 it natural 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 figure, 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 a 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 hardneſs, 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 leſs obnoxious to external 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 preſs more ſtraitly the things they once take hold of; ſo, that beholding them cloſe together we can hold Water that it may not run out. The length of the Fingers is unequal, that when they are opened and ſtretched forth, they make as it were, a circular figure; for ſo it comes to paſs, 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 all the parts of the Hand taken in general and particular, whereby we may more commodiouſly hereafter handle all the proper parts thereof.

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 *Cephalick*; therefore this *Cephalick* paſſing forth of the *Subclavian* runs ſuperficially along the fore-ſide, between the Muſcle *Deltoides*, and the tendon of the pectoral 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 ſhewn hereafter.

The Cephalick Vein.

The Median Vein.

How by opening the Median Vein you may draw more or leſs bloud from the Head or Liver.

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 judge it muſt be opened, for a general 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 ſtraightneſs of the Fibers, rather than 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, until you ſuppoſe you have drawn a juſt quantity of bloud from the Liver by the *Baſilica* or Liver-vein; which done, you may take off your Thumb and ſuffer the bloud to follow freely, by the open branch of the Cephalick, until you have drawn as much bloud as you ſhall judge requiſite, otherwiſe you will draw it but from one part, to wit, the Head. So you ſhall evacuate it onely from the Liver, if you open the branch which comes from the *Baſilica*, and concurs to the generation of the Median.

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 do 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 After-wriſt. Sometimes it runs back into the following branch,

and

and then at the Wriſt it departs from it, to be beſtowed upon the fore-mentioned 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 increaſed 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 fore-named parts, that by the way they yield them neceſſary proviſion.

CHAP. XXII.

The Deſcription of the Axillary Vein.

The Axillary ariſing at the inſertion of the pectoral 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 external 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, as the former alongſt the cubit ſends branches to the reſt of the fingers, like as the former. The third goes on the fore-ſide between the two bones even to the wriſt, and the ſquare Muſcle.

The axillary is divided into the deep Axillary, and outward Axillary

But you muſt note that the Veins of which we now treat, do not onely make theſe diviſions mentioned by us, but infinite others beſides, as well in the parts which they go to, as alſo in the inner Muſcles of the hand which they nouriſh.

And thus much of the internal and deep axillary Vein. For the external 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 thickneſs, 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 deſcended 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 always 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 original, which is preſently after the 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 external 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 Artery. 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 de-articulation 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 general Rule, that every Veſſel 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 then 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 infinite and needleſs buſineſs to handle all the divarications 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 branches, the one of which alongſt the Wand, and the other alongſt the Cubit, is carried 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 internal axillary Vein, that is, having ſent by the way ſome little ſhoots into the parts by which they paſs, 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 Anatomical Axiom.

CHAP.

CHAP. XXIV.

Of the Nerves of the Neck, Back, and Arm.

The 7 pair of Nerves of the Neck.

NOw we ſhould handle the ſinews 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 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 of the firſt pair of the Back from the laſt *Vertebra* of the Neck, and the firſt of the Cheſt. But all theſe Nerves, 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 fore-ſide of the Neck.

The ſecond pair.

The branches of the ſecond pair are diſtributed, ſome with a portion which they receive from the third pair over all the skin of the head; the two others go as well to the Muſcles, which are from the ſecond *Vertebra* to the back-part of the head; and from the ſame to the firſt *Vertebræ*, as alſo to the long Muſcle before-mentioned.

The third pair.

One of the third pair of ſinews is communicated to the Head, as we ſaid before, but others to the Muſcles which extend, or erect 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 fifth and ſixth pair to the Midriff.

The fifth pair.

One of the branches of the fifth pair is beſtowed on the hind Muſcles of the Neck and Head, the other upon the long-Muſcle and Midriff; the third is communicated to the *Levatores* or Heaving-Muſcles of the Arm and Shoulder.

The ſixth pair.

One of the Nerves of the ſixth pair goes to the hind-Muſcles of the Neck and Head, another to the Midriff, 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, increaſed with a portion of the fifth and ſixth pair of the Neck, and a third joined 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 onely from the *Vertebræ* from whence they take their original, but alſo from them which they come near in their deſcent, or aſcent.

The 12 pair of Nerves of the cheſt.

There paſs twelve Conjugations of Nerves from the Rack-bones of the Cheſt.

The firſt pair.

The firſt entering 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 intercoſtal 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 coſtal Nerves of the ſixth Conjugation are augmented by meeting theſe intercoſtal 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 paſs forth, or run alongſt by the *Vertebræ*, from whence theſe Nerves have either their original or paſſage forth.

The Nerves which are carried to the Arms.

Having thus therefore ſhewed the original 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 four or five when they have mutually embraced each other, not onely from their firſt original, 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, until 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*, and 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 fore-ſide, it is mingled with the fifth pair.

The fourth the largeſt of all the reſt, coming down below the third branch under the *Biceps* with the internal Axillary Vein and Artery, is turned towards the outward and back-part of the Arm, there to communicate it ſelf to the Muſcles extending the cubit, and alſo to the inner skin

of

of the arm, and the exterior of the cubit; the remainder of this branch when in its descent it hath arrived at the joynt 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 fifth upon the middle finger, though more obscurely.

The fifth branch being also lower than the rest, sliding between the muscles bending and 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 internal 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, and the other within the ring, go 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 small portions, of which these which are from that portion which descends without the ring, send two sprigs to the little, two to the fore, and one to the middle finger, but those 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.

BEcause we cannot perfectly demonstrate the original 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 original 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 forside, another on the hind, between which swellings there is a cavity like to half the compass of a wheel, about which the cubit is moved. The extremity of this cavity ends in two holes, of which one is the more external, the other more internal: These cavities receive the heads of the cubit, that is, the fore, or internal, receives the fore process when the arm is bended inwards; but the external or hinder, the exterior as it is extended.

The greatness and figure.

The appendix of the arm.

The processes of the arm.

For the head of the arm, it hath a double connexion, the one with its own neck by *Symphysis*; that is, a natural 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 de-articulation 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 foreside, 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 fastened to the bones of the cubit by two sorts of articulation; that is, by *Ginglymus*, with the Ell or proper bone of the cubit; and by *Arthrodia*, with the *Radius*, or Wand, which in a lightly ingraved cavity receives the fore process of the arm, and is turned about it for the motion of the hand. The hinder process is chiefly added for the safety and preservation of the veins, arteries and nerves.

These things thus shown, it is worth our labour to know the figure of the arm it self, as it lies between the fore-mentioned appendices and processes; that, in the case of a fracture, we may know how conveniently to reshore 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 figure of the arm.

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, two 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 forwards nor backwards; but thus, That it cannot be moved neither to this nor that part, unless by the help and proper action of this, or that muscle. Thus therefore, if the pectoral with his associate perform their duty; or action, the arm is always moved forwards, as it is lifted up by the action of the *Deltoides*, and his companion, and so of the rest.

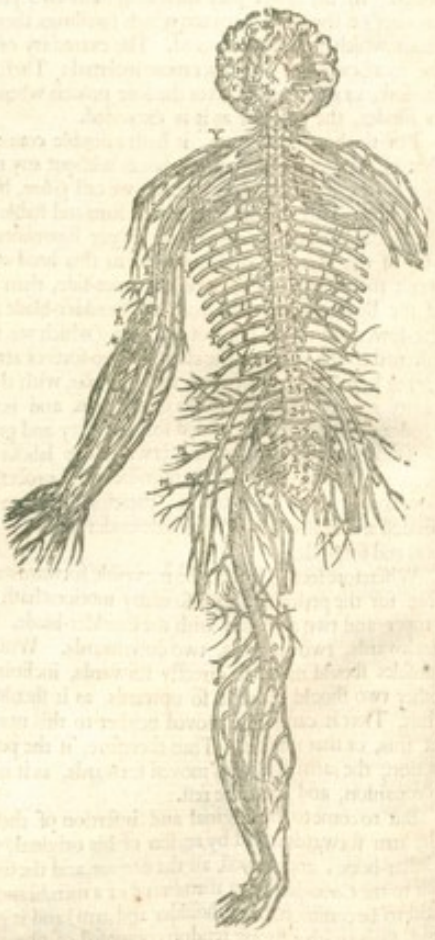
The eight muscles thereof.

But to come to the original and insertion of these muscles; the one of these two which move the arm forwards called by reason of his original, the Pectoral, arising from more than half of the Collar-bone; and almost all the *Sternon*, and the sixth, seventh and eighth rib, goes up and fastens it self 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 original hereof; that is, from the sixth, seventh and eighth ribs; and although the action of this muscle be diverse by

The original and insertion of the pectoral muscle.

reaſon of the diverſity of its fibers ariſing from divers places, yet always it draws the arm forwards, whether it be moved upwards, downwards, or to the breaſt; the other which is his companion, deſcends from the whole lip or brow of the ſinous, or hollow part of the blade, which it fills in the fore-part of the arm near the head thereof. For the two *Levatores*, or the lifters up of the arm, the
The *Deltoides.* firſt named *Deltoides*, deſcends almoſt from half the clavicle, the proceſs *Acromion*, and all the ſpine of the ſhoulder-blade into the fore-ſide of the arm, the breadth of four fingers below the joynt. 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 ſpinal alone, or by both at once, it always 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
The *Epomis*, or *Scapularis.* ſpine between the proceſſes *Acromion* and *Coracoides*, to the neck of the arm; and this we will 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, near 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 ſtait 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 it is inſerted by a membranous tendon, as alſo it is into the inner part of the arm near the 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.

Table 24. *Sheweth the Brain together with the After-brain, the Spinal 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 ventricles.*
C *The back part of the brain.*
D *The* Cerebellum *or After-brain.*
E *The mammillary proceſs in the right-ſide.*
F *The original 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 root of the third conjugation.*
L *The thick root of the ſame conjugation according to the common opinion.*
M *The fourth conjugation of the ſinews.*
N *The leſſer root of the fifth pair.*
O *The bigger root of the ſame pair.*
P *The ſmall membrane of the ear which they call the* Tympany.
Q *The lower branch of the bigger root of the fifth conjugation.*
S *The ſixth pair of ſinews.*
T *The ſeventh pair.*
V *The beginning of the ſpinal marrow out of the middle of the baſis of the brain.*
X *The right ſinew of the midriff cut off.*
Y *A branch from the fifth 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 out-ſide.*
C *A branch from the third nerve to the ſecond muſcle of the cubit.*
D *The congreſs, 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 lengthened out to the skin as far as the thumb.* a *The place of the ſpinal*

nal marrow, where it iſſueth out of the brain, 1 2 3, &c. *Thirty pair of nerves ariſing from the ſpinal marrow are here noted by their Char. that is to ſay, ſeven of the neck, twelve of the cheſt, five of the loins, and ſix of the holy-bone.* b *The thicker branch of the ſecond nerve divided into two parts.* c *Branches of the the third nerve ſprinkled here and there.* d *Nerves from the third pair to the thumb, the fore-finger and the middle-finger.* ee *The fourth 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 fourth nerve to the outward skin of the cubit.* i *The upper branch of the diviſion of the fourth nerve.* kk *A branch of* i, *reaching it to the outſide of the hand.* ll *The lower branch of the diviſion of the fourth nerve paſſing through the back-ſide of the cubit.* m *The fifth nerve of the arm.* n *Branches of this nerve diſperſed here and there.* oo *A branch of the fifth nerve, reaching to the inſide of the hand and the fingers.* p *A ſurcle of the branch* o, *derived to the outſide of the hand and fingers,* q q *The ſixth nerve of the arm and the courſe thereof under the skin.* r r *The intercoſtal nerves there cut off where they are together with the ribs reflected forward.* ſ ſ *Branches on each ſide running backward.* t t *Nerves attaining unto the cheſt.* u u *The commixtion of the nerves* r r *with the deſcending branch of the ſixth conjugation of the brain.* xx *Nerves from the loins led unto this place.* y *A branch going to the teſticles here cut off.* z *A nerve reaching to the firſt muſcle of the thigh.* c *The firſt nerves of the leg.* α β *A ſurcle of the former nerve derived to the skin at* α, *and inſerted into the muſcles at* β γ, *the ſecond nerve of the leg.* δ δ δ *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 ſecond nerve running unto the muſcles.* ζ *The third nerve of the leg.* η *A ſurcle thereof unto the skin.* θ *Another ſurcle unto the muſcles.* ι ι *The fourth nerve of the leg.* κ κ *The anterior propagation of the nerves proceeding from the holy-bone.* λ *The end of the ſpinal marrow.* μ *A branch from the fourth nerve inſerted into the muſcles ariſing from the* Coxendix, *or hip-bone.* ν *Another branch going to the skin of the thigh on the back-ſide.* ξ *A propagation derived to the fourth muſcle of the leg, and to the skin of the knee.* ο ο *Nerves attaining to the heads of the muſcles of the foot.* π ρ *The diviſion of the fourth crural nerve into two trunks* σ *a branch from the trunk* τ *diſperſed into the outward skin of the leg.* τ *A ſurcle of the trunk* τ, *derived to the muſcles.* υ *Another ſurcle to the skin of the leg on the fore-ſide.* φ *A branch of the trunk* ρ, *to the skin of the inſide of the leg, and of the foot,* χ *A ſurcle of the trunk* ρ, *to the hind-moſt skin of the leg.* ψ *A branch of the whole trunk* ſ, *led along to the forward part of the leg and the foot.* ω *The deſcent of the trunk* ρ *into the foot.*

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, unleſs 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 oft-times 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 call the *Radius*, or Wand, or the leſſer *Focile* of the arm; the other we properly call the Cubit, or Ell. Theſe two bones ſtick together at their ends being firmly bound together by ſtrong ligaments; but the middle-parts of them are a pretty 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 hallowed on the ſurface like a Baſon, it receives the fore proceſs of the bone of the arm, bound to the ſame by ſtrong ligaments, deſcending as well from the proceſs 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 out-ſide 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 which lies next to the Ell is flatted for the fitter original and ſeat of the Muſcles; laſtly, it is ſeated upon the bone of the Cubit, or Ell, juſt againſt the thumb. But the Ell, or bone of the cubit properly and 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 unequal bigneſs, the which are therefore ſtayed in the holes or cavities of the bone of the arm, the greater proceſs which we called *Olecranon* is letted by the exterior hole, that ſo the extenſion of the arm can be no further, but the leſſer proceſs by the inner hole, makes the bending thereof the leſs perfect. The compoſure of theſe bones is by *Ginglymus*, and it is ſtrengthned not only by common ligaments coming from the muſcles, which move the bones themſelves, but alſo by proper liga-

What is meant by the cubit.

What the *Olecranon* is.

The two bones of the cubit.

The two appendices of the wand.

The figure and ſite of the wand.

The appendices of the bone of the cubit.

ments, 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 fort hollow on the inſide for the fitter receiving the bones of the wriſt, but the outſide is round, and ends in a point, which 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 ſtrait, unleſs 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 ſtrait; 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*, the other from the lip of the cavity of the ſhoulder-blade by the fiſſure or cleft 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 faſtened 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 (faſtened, and as it were always ſtraitly joyned with his fellow-muſcle, ſpecially near the cubit) wherefore 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 *Olecranum*, ſo by mutual aſſiſtance to extend 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, After-wriſt and Fingers.

WE ſaid before, that the hand taken more particularly, and properly, is divided into the wriſt, after-wriſt, 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 after-wriſt, 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 continual going. Beſides the common parts, the wriſt is compoſed of eight ſmall 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 always from the upper to the lower. But theſe ſame bones are ſome leſs than otherſome; beſides, they are hard, and without marrow, gibbous on the outſide for the ſecurity and comelineſs 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, 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; and the third may be received by the wand. But three of the five bones of the ſecond order ſuſtain the four bones of the after-wriſt, and are knit to the ſame by *Synarthroſis*; after which manner of connexion they are joyned to the bones of the firſt rank; the fourth ſuſtains the firſt bone of the thumb, to which alſo it is co-articulate by *Synarthroſis*; the fifth 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 leaſt and weakeſt of them 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 hand properly ſo called is.

What the *Anulus* 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 and 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 puſhing 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 ſtrait line.

The bones of the after-wriſt.

Now follow the bones of the ſecond part of the hand, or of the after-wriſt. Theſe are four in number, gibbous without, but arched within, or hollow in the middle; for, hence is the palm of the

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 *Interossei* 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 after-wrist, we mean that which is in the fore-side of the hand, that is to say, that in the wrist which lies under the thumb, and that in the after-wrist, which is seated under the fore-finger, as those which keep in order the fingers; which exceed the rest in necessity and dignity.

The Figure of the Bones of the Hand. The first sheweth the inside of the right-hand, and the second shews the back-side of the same.

FIG. I.

FIG II.

The Character 1 2 3 4 5 6 7 8 *shew the eight bones of the wrist.*
A 1 2 *The first bone of the after-wrist, lying under the thumb.*
I II III IIII *The four other bones of the after-wrist annexed to the fingers.*
BC *The two bones of the thumb.*
DEF 1 2 *The three bones of the fore-finger which are the same in the other fingers.*
M 1 2 *A little bone sometimes fastned outwardly at the joynt of the eighth bone of the wrist.*
N 1 *A process of the eighth bone of the wrist, swelling out into the ball of the hand.*
O 1 *A process of the fifth 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 after-wrist.* Q 2 *Another appendix which with its head entereth into the cavity of the finger.* R 1 2 *The space between the bones of the after-wrist.* S 1 2 *Two little seed-bones set on the inside and outside of the first joynt.* T 1 *Two seed-bones in the first of the four-fingers.* V V 1 *One seed-bone in the second and third joynt 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 gross 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 joynt. 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 over-thwart from one side to the other, doth so straitly close the tendons to their bones, that they cannot go forth of their places, or incline to either side. They are connexed on the out-side, that they might be more fit to hold any thing. But for the first bones of the four fingers and thumb, four are joyned together with so many bones of the after-wrist by *Synarthrosis*, for the bones of the after-wrist are moved by no manifest motion; the fifth is knit to the second rank of the bones of the wrist, therefore that bone cannot be attributed to the after-wrist, as some have written, seeing it hath manifest motion and is knit by *Diarthrosis*, but the bones of the after-wrist 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 after-wrist; and those of the second rank, them of the first; and those of the third, them of the second. And all 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 nerves, 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 Sesamoides*, or seed-bones: These are nineteen in number in the inner joynts of each of the hands, and as many in each foot, *viz.* Two in the first joynt of the four fingers, and in the second of the thumb, and one in each of the rest. For the inner side of the joynts; you may for the most part observe one in each of them; yet in the second joynt of the thumb there be two above the two tendons, which are somewhat gristly.

The bones of the fingers.

Whence the nails are generated.

The *Ossa Sesamoides*, or seed-bones.

They are made for this use, that they may firm and strengthen the joynts, 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 whirlbone 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.

The muſcles of the cubit.

NOw we muſt deſcribe the muſcles of the formerly deſcribed parts; that is, thoſe which are ſeated in the cubit, which are carried to the inſide of the hand, and thoſe which are called the *Interoſſei*. Now the muſcles of the cubit are fourteen, ſeven external, and ſeven internal; two of the ſeven external do 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 turnes up of the hand; two extend the wriſt, whereupon they are named *Carpi-tenſores*, or the wriſt-extenders; two the fingers, whence they are ſtiled *Digitum-tenſores*, or finger-ſtretchers; to conclude, the ſeventh and laſt is termed *Abductor*, or *Obliquator exterous*.

The *Supinatores*.

The *Carpitenſores*.

The *Digitumtenſores*.

The *Obliquator externus*.

The firſt of the *Supinatores*.

The ſecond.

The upper of the *Carpitenſores*.

The lower.

The firſt of the *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 proceſs 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 proceſs of the arm, is inſerted by two tendons into the firſt and ſecond bone of the after-wriſt, which ſuſtain the fore and middle-fingers.

The other and lower, deſcending from the ſame place as the former, above the cubit, is inſerted into the fourth bone of the after-wriſt which bears up the little-finger. Theſe muſcles whilſt 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 after-wriſt) in the laſt joynts of the four fingers, adhering nevertheleſs firmly to the bones, which are above theſe joynts.

The greater of the *Digitumtenſores*.

The leſſer.

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 joynt thereof, and by its action extending the thumb.

The *Obliquator* or *Abductor externus*.

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 into two, yea verily we have found it trifide, or divided into three, this year in three or four 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 fore-fingers, and the third to the thumb.

And for all that it is thus divided, yet ſome have taken and accounted it for one muſcle, becauſe it hath one original and action, which is, to draw the fingers backwards; ſome have added to this the extender of the thumb, by reaſon of their common original; 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 four; or in nine, if you had rather reſolve it into four 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 palm of the hand, whence it is called the *Palmaris*. The ſecond and third joyned by the communion of their action turn down or prone the wand, and conſequently the hand, ſo that the palm looks towards the feet, whereupon they are called *Pronatores*.

The fourth and fifth joyned alſo in affinity of action bend the wriſt, wherefore they are named *Carpi-flexores*, wriſt-benders. The ſixth and ſeventh are appointed to bend the firſt, ſecond, and third joynts of the fingers, wherefore they are termed *Digitum-flexores*, *Finger-benders*. For their original; the *Palmaris*, the leaſt and uppermoſt of them all, deſcends fleſhy from the hind-proceſs of the inner arm, and a little after ending in a long ſlender tendon, it is ſpent in the skin of the palm of the hand even to the roots of the finger. For it was neceſſary that the 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 wrinkled and drawn away from the palm 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, equal, rough, ſoft, hard, great, little, and ſuch other qualities.

The *Palmaris*.

The *Pronatores*.

Then follow the two *Pronatores*, of which one called the round, comes obliquely from the inner ſide of the hind-proceſs of the arm almoſt to the middle of the wand, to which it adheres by a membranous and fleſhy 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. Both the *Carpi-flexores*, or wriſt-benders, ariſe from the hind, but inner proceſs, and deſcend obliquely, (the one

The *Carpiflexores*.

more

more, or leſs 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 eighth bone of the wriſt, which we ſaid made part of the ring; the other which follows 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.

Now remain the *Digitum-flexores*, or finger-benders, 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 part of the ell and wand, deſcends between the two bones of the cubit, even to the wriſt and ring; divided into four tendons it is inſerted into the ſecond de-articulation 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 four tendons near 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 joynt of the fingers. The *Digitum-flexores*. The *Sublimis Digitum-flexor*.

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 five tendons which it brings forth under the common ligament, and the diviſions of the tendons of the *Sublimis* even to the laſt joynt of the fingers, which they bend, by this their proper inſertion, as alſo of the bones of the firſt and ſecond joynts of the fingers by the means of the common ligament and fibrous productions which they beſtow upon them by the way. Beſides theſe fore-mentioned, there is ſeen alſo a certain membranous ligament which engirts the tendons in the compaſs of the fingers. The *Profundus Digitum-flexor*.

CHAP. XXXIX.

Of the Muſcles of the inſide of the Hand.

THe muſcles of the inſide of the hand are ſeven in number; the firſt is called *Thenar*, becauſe it makes the greater part of the palm; the ſecond from the ſite is called the *Hypothenar*; the third the external *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 after-wriſt, taking its beginning from that bone which bears up the ring-finger, whence aſcending alongſt the vital line even to the end thereof at the firſt bone of the after-wriſt ſuſtaining the fore-finger, it is at length inſerted into the laſt joynt of the thumb by the longeſt fibers, but by the middle and ſhorteſt fibers almoſt into all the inner parts of the firſt bones of two joynts, and by reaſon of this, the thumb is drawn to the other fingers, and from them again by his lower original. The number of the muſcles of the inſide of the hand. The *Thenar*.

Some divide this muſcle into three, by reaſon of his diverſe actions, making the firſt to ariſe from the root of the bone of the after-wriſt which bears up the ring-finger; but the other from that middle bone of the after-wriſt which ſuſtains the middle-finger; but of the third, from the upper end of that bone which under-props 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 doctrine of the number of muſcles.

The *Hypothenar* ariſes from the fourth bone of the after-wriſt, and that bone of the wriſt which ſuſtains it, and then with its longeſt fibers, it is inſerted into the ſecond joynt of the ring-finger, and by the ſhorteſt into the firſt, through which occaſion, as alſo in reſpect of its two-fold 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 external *Abductor* of thumb, deſcends from the firſt bone of the after-wriſt, into the firſt and ſecond joynt of the thumb; wherefore ſome have divided it into two. The *Lumbrici*, or four external *Abductores*, of the fore-fingers, ariſe from a membrane, inveſting and binding together the tendons of the *Digitum-flexores*, or finger-benders, and at length on the ſides towards the thumb even by a ſmall tendon, running even to the ſecond joynt of the four-fingers. The external *Abductor* of the thumb. The *Lumbrici*.

Now the *Interoſſei* of the after-wriſt, remain to be ſpoken of; theſe are ſix, two in each of the ſpaces between the fingers, one internal, the other external, of which the internal deſcending with oblique fibers from the ſide of the firſt bone of the after-wriſt, goes alſo into the ſides of the fingers, that ſo it may the more cloſely bind together the bones of the after-wriſt, 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 external aſcends alſo by oblique fibers from the ſides of the ſecond bone of the after-wriſt, to the firſt joynts of the fingers, interſecting the internal, 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 of the thumb. The *Interoſſei*.

Here concluding the deſcription of the muſcles of the whole hand taken in general, you ſhall note that they are thirty nine in number, that is, eight appointed to move the arm; four ſet to move the cubit, in general; ſeven ſeated on the out-ſide 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 *Interoſſei*. Some increaſe this number, ſaying, there are nine on the external part of the cubit, and eleven on the inſide of the hand. The number of the muſcles of the whole taken in general.

CHAP. XXX.

A deſcription of the Leg taken in general.

AFter the hand follows the deſcription of the leg. Wherefore to take away all doubtfulneſs, we will firſt define the leg; then divide it into the parts more and leſs 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.

The diverſe acception of the leg. The thigh. The leg or ſhank. The foot.

Now this word *Crus*, or Leg, is uſed two manner of ways, 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 foot. But with an adjunct for the greater bone thereof. But the leg taken in general, 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 knée and the foot. By the foot, all from thence to the ends of the toes.

The diviſion of the foot. The inſtep. The top of the foot. The toes.

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 after-wriſt. 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 general.

CHAP. XXXI.

A deſcription of the Crural-vein.

The beginning of the crural-vein. The two branches thereof.

THe Crural-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 always apparent and manifeſt, is called properly by the Greeks *Saphena*, but commonly *Saphena*.

By what veins the matter cauſing thoſe tumors called *Bubones* flow down.

This vein, by the way, preſently at its original is divided into two branches, the one internal, the other external; of which the internal 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 breadth 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 fore-ſide, and the other on the hind-ſide. Fourthly, it is diſtributed by two other ſmall ſprigs into the skin, on the four and hind part of the knee; which often-times are not found, eſpecially when the *Poplitea*, or ham-vein, is ſomewhat larger than ordinary. Fifthly, 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 certain other ſprigs, which it produces into a branch of the *Poplitea* paſſing forth of the two twin-muſcles. Sixthly, 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 fore-ſide as the back-ſide of the leg.

Where, and in what diſeaſes, the *Saphena* muſt be opened.

At length, after many diviſions, which for brevity 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 midriff 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 parts of the foot and toes.

To what places, and by how manifold diviſions the internal branch of the crural vein goes. *Iſchiadica vena.* *Muſcula vena.* *Poplitea vena.*

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 *Saphena*, into 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 four muſcles of the thigh, neither are theſe ſprigs far remote from one another. Secondly, all that branch is divided into two other branches, the one above, the other below, an artery always 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 increaſed with branches of the *Saphena*, it goes on the out-ſide of the ankle to the skin, on the upper-ſide of the foot, and ſometimes on the lower.

Thirdly, a little below the original of the ham-vein, and under the bending of the knee, it brings

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.

Fifthly and laſtly, it brings forth the *Iſchiadica major*, or greater *Iſchias*, which is divided into two branches of an unequal bigneſs; the larger whereof, from his original 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 furcles, even to the fourth toe, and the ſides of the middle toe. *Iſchiadica major.*

CHAP. XXXII.

The Diſtribution of the Crural Artery.

THe Crural Artery ariſing from the ſame place whence the Crural vein proceeded, and deſcending with the internal Crural 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 joyned 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 *Solæus*, the one internal, the other external; the internal, ſome furcles communicated by the way to the parts by which it paſſes, but ſpecially to the joynt 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 furcles, of which it beſtows two on the great toe, two on the next, and one on the middle toe. The external 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 joynt 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 external and internal branches; the external are diſſeminated into the *Rachitæ*, or chin-muſcles, the muſcles *Semiſpinatus* and *Sacer*, and skin lying over them. The internal are ſent into the oblique aſcendent and tranſverſe-muſcle of the lower belly, into the *Peritonæum*, 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 coſtal 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 portion of thoſe of the holy-bone, go 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 ſixth which proceeds from the loweſt part of the holy-bone, and the firſt of the Rump. Theſe Conjugations of nerves are divided into external and internal branches. The conjugation of the nerves proceeding through the holy-bone.

The leſſer external paſſing forth by the external 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 always yields to the neighbouring parts, that which is needful, then preſently to others as much as it can. An Anatomical 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 nerves, each part may have nouriſhment, life and ſenſe. The other internal branches of the foreſaid conjugations go, eſpecially the four uppermoſt united from their original with the three lowermoſt of the loins, into all the legs, 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

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 coſtal 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 original, 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 holy-bone, are divided in the thigh into four branches, of which the firſt and higher deſcending from above the *Peritonæum*, 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 ſecond, deſcending with the crural vein and artery by the groin, is divided into two branches like as the vein, the one internal, the other external; of which the internal deſcending with the vein and artery is ſent into the inner and deep muſcles of the thigh, ending above the knee. But the external deſcending ſuperficially with the *Saphœa*, 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 ends at the midſt of the thigh.

The fourth, which is the thickeſt, ſolideſt, and hardeſt of all 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 other ſome to the skin of the buttocks, and alſo to the skin covering the fore-mentioned 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, where 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 knowledg is impertinent.

CHAP. XXXIV.

Of the proper parts of the Thigh.

HAving explained the common parts of the leg in general: 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 thoſe 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 called the *Os Ilium*, the hanch-bone, and it is the largeſt and biggeſt, having a griſtly Appendix in the compaſs 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 adjoyned 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.

What the Os Ilium ſtrictly taken is.

What the line, lip, brow and rib of the Os Ilium are.

But that which lies between the *baſis* and ſtrait line, we name the Rib; this ſame upper bone hath two hollow ſuperficies, the one internal, the other external. The connexion thereof by *Symphyſis*, is twofold, the one with the upper part of the holly-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*, 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 fore-mentioned cavity; but, that on the hinder and lower part thereof, it brings forth a proceſs, which adjoyns it ſelf to the ſhare-bone at the lower part of the common hole, in which place it appears very rough and unequal, and it is called the Tuberoſity of the huckle-bone, at whoſe extremity alſo it brings forth a little head ſomewhat reſembling the proceſs of the lower jaw called *Coronæ*.

The Os Iſchium, or huckle-bone.

The Os pubis or ſhare-bone.

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 follows the thigh-bone, the biggeſt of all the bones of the body; it is round, and ſo bended, that it is gibbous on the exterior and fore-part thereof, that ſo it might be the ſafer from external

external injuries; but on the hind and inner part, it is hollow, or sinous, like to the back of an Ass, whereby the Muscles might have a more commodius original and insertion.

That sinous part a little below the midst thereof, is divided into two lines, the one whereof goes to the internal tuberosity, the other to the external 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 original.

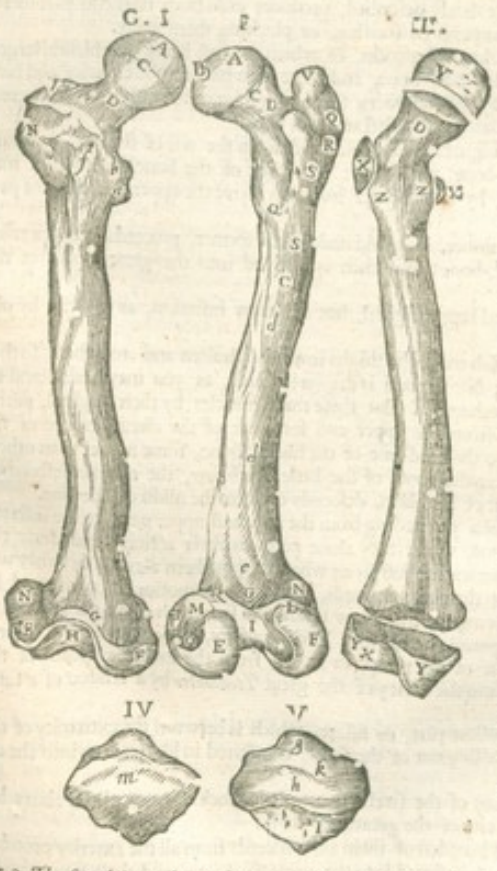
Besides, this bone hath two appendices in the ends thereof, as easily appears in a childs thigh; the upper appendix makes the round head of the thigh it self, which (as every other appendix) seated upon a long neck, is received in the cavity of the hanch-bone, by *Enarthrosis*; it is stayed and fastned 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 two-fold, that is, one membranous and broad, proceeding from 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 Appendices of the thigh-bone.

Besides, under this head, that bone hath two processes, the one great and thick, the other little and short. The two processes of the thigh-bone make the two *Trochanters*.

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 bosom, into which the Twin-muscles and others, whereof we shall hereafter speak, are implanted; we must also consider the multitude of holes encompassing this neck, between the head and the two *Trochanters*; which yield 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 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 I 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 fifth 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 do pass.*

P 2 *A protuberation at which the said tendons are reflected.*

Q 2 *The upper process of the thigh, and betwixt* Q *and* D *is the* Sinus.

R 1 2 *The union of the process with the thigh.*

S S 2 *A rough line from the impression of the external processes.*

T 1 *The anterior impression of the internal processes. & betwixt* T *and* V, *another impression higher than the former.*

V 1 2 *The fourth impression in the top of the process* X 3. *Four* X *shew the four appendices of the thigh,* Y 3 *Three* Y *shew the three heads of the thigh.* Z Z 3 *Two processes of the thigh.* a 1 *The interior process of the thigh.* b 1 *The conjunction of the process with the thigh.* c c 2 *A line descending obliquely from the inner process.* d d 2 *A line running through the length of the thigh.* e 2 *The largeness of the thigh in this part.* f 1 *A roughness from which the eighth muscle issueth.* g h 5 *A knub of the whirl-bone going in-*

to

to the Sinus *marked with* I, *which is betwixt the heads of the thigh.* i 5 *A* Sinus *fitted for the inner head of thigh.* k 5 *A* Sinus *agreeing with the external head of the thigh.* l 5 *The lower aſperity or roughneſs.* m 4 *The foreſide of the pattel or whirl-bone, rough and unequal.*

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 eminency, 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. XXV.

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 *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 croſs our legs; yet ſome make theſe three one, and call it the *Triceps*, or three-headed 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 thickneſs, original inſertion, and action; the two other are called *Obturatores*, becauſe they ſtop the hole which is common to the ſhare and back-bone.

The two *Flexores.* Now one of the two *Flexores*, being round, deſcends on the inſide with fibers of an unequal length from all the tranſverſe proceſſes of the loins, above the hind-commiſſure of the haunch and ſhare-bones, and is inſerted into the little *Trochanter*; the other broader and larger from the original paſſes forth of the whole lip, and inner brow of the haunch-bone, and filling the inner cavity thereof, is inſerted above the fore-part 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 external, ariſing from the rump, the holy-bone, and more than half of the exterior and hinder lip of the haunch-bone, is inſerted by oblique fibers, ſome four fingers breadth from the great *Trochanter* at the right-line, which we ſaid, reſembled an Aſſes back.

The ſecond, which is the middle in bigneſs and ſite, deſcends from the reſt of the hip, and from the fore and outward rib of the haunch-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 external ſurface of the haunch-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 original, but a narrow inſertion, as it were, by oblique fibers.

Three *Intromittentes.* Then follow thoſe three muſcles which move the thighs inwards, ſtraiten and croſs 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 original, partly fleſhy, and partly membranous, ariſe from the upper and fore-part of the circumference of the ſhare-bone, and thence are inſerted into the hind-line of the huckle-bone, ſome higher than other-ſome; for the leſſer and ſhorter ſtays 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 a-croſs, 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 *Quadrigemini*, 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 largeneſs.

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 exterior protuberancy 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 original.

The two *Obturatores.* The two *Obturatores* remain to be ſpoken of, that is, the internal and external, 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 internal aſcends to the exterior root of the great *Trochanter*, by

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 external proceeds from the exterior 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 *Quadrageminis*.

If you would plainly ſee the exterior *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 internal is eaſily diſcerned when the bladder is taken away.

CHAP. XXXVI.

Of the Bones of the Leg or Shank.

THoſe which would deſcribe the muſcles of the leg, ought firſt to deſcribe the bones thereof, beginning at the *Rotula*, or whirl-bone of the knee. What the *Patella* or whirl-bone of the knee is.

This bone is griſtly on the out-ſide, and round in compaſs, 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 joynt of the knee, and fitted within the anterior cavity of the two appendices of the thigh, and the upper and fore-moſt of the leg.

The uſe thereof is to ſtrengthen the joynt of the knee, and to hold the leg at his due extent, ſo that it may not be bended ſo far forwards, as it is backwards. The uſe thereof.

The bones of the leg are two; the one thicker, called by the particular and proper name, the *Os Tibiæ*, or leg-bone; the other which is leſſer, is termed *Perone*, or *Fibula*, but commonly the leſſer *ſcale*, (and in Engliſh it may be termed the ſhin-bone) The thicker being hollow and marrowy, is ſeated in the inner part of the leg, having two proceſſes, the one bigger, the other leſs. What, and how many bones the leg hath. The leg bone.

The bigger ſeated on the upper-part of the bone, and conjoyned to it by *Symphyſis*, makes two ſuperficial and ſide cavities disjoyned by an indifferent riſing; wherefore this bone is connext to the bone of the thigh by *Ginglymus*. For in the cavities thereof it receives the lower and hinder protuberances of the appendix of the thigh-bone, but the middle eminency thereof, is received by it between the two protuberances thereof.

This joynt 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 external; another from all the internal parts of that connexion; the third, which we out of *Hippocrates*, called *Diaphyſis*, from the diſtance or ſpace between them. The other proceſs of the leg-bone, which we called the leſs, 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 Croſs-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 *Antiemmion*; the ſecond reſides on the inner-part; and the third on the outer: All theſe muſt be diligently obſerved, and chiefly, that on the fore-part; becauſe it is as a guide and rule to a Chirurgeon in the well-ſetting of a broken leg. What *Diaphyſis* is.

The *Perone*, or ſhin-bone, is ſeated, as it were, on the out-ſide, 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 inſtead 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 alſo receives part thereof, which is joyned on the ſame ſide with the heel, eſpecially then when we bend our foot outwards. The *Perone*, *fibula*, or ſhin-bone.

This bone is faſtned to the fore-mentioned 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, and another on the foreſide, and the third behind.

CHAP. XXXVII.

Of the Muſcles of the Legs.

ALL the motions of the leg, are performed by eleven muſcles, of which there be ſix on the fore-ſide, and five on the hind. But of theſe, ſome move the leg only, as thoſe which take their original 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. Their number.

The firſt of theſe on the fore-ſide, 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 croſs 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 fore-mentioned action. The *Longus*.

The ſecond of theſe four muſcles is termed the *Membranoſus*, or membranous, becauſe it is wholly ſuch, unleſs at the original 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 The *Membranoſus*.

(mixed with the common coat of the muſcle) 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 general.

The *Rectus.* The third, called the *Rectus*, or Right (becauſe it deſcends above the *Cruræus*, alongſt the right fore-line of the thigh, between the two vaſt muſcles) comes forth between the extremity of the appendix of the haunch-bone and cavity thereof, with a very ſtrong ligament, and then is inſerted into the fore-part of the leg, paſſing over the midſt of the whirl-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 largeneſs, the one of theſe is internal, the other external: They both ariſe with right fibers, from their original, 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 disjoyn both the knees; the internal 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 external paſſes forth by its right fibers from the root of the great *Trochanter*, but by the oblique from the external deſcendent line of the ſame bone. But all theſe fibers are in certain places ſo mixed with the *Cruræus*, that they cannot be ſeparated unleſs 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

The *Cruræus.* it makes an unſeparable tendon, as you ſhall preſently hear. The ſixth and laſt of theſe fore-muſcles called *Cruræus*, 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 muſcles, and two vaſt muſcles into the fore-part of the thigh, even to the whirl-bone 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 tuberoſity of the huckle-bone, going into the inner part, the fourth from the middle of the *Pubis* called *Biceps*, that is, the two-

The three internal. headed muſcle into the outſide of the Leg. Of the internal, one paſſing from the fore-mentioned 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 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 fore-mentioned.

The *Biceps*, or two-headed muſcle. The fourth called *Biceps* takes one of the two heads, of which it conſiſts, from the laſt mentioned tuberoſity, the other from the outer line of the thigh, but is inſerted into the external part of the leg, as we formerly ſaid.

The *Popliteus* or ham-muſcle. The fifth and laſt called the *Popliteus* deſcends obliquely fleſhy from the external condyle or knot of the thigh, into the inner and hinder part of the leg, at the joyning thereof to the ſhin-bone; the action thereof is, to draw the leg, after a manner inwards.

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, therefore 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 after-wriſt, or back of the foot five; and thoſe of the toes, fourteen. Of the ſeven bones of the inſtep, there are four named, and three 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 proceſs of the bone of the heel; the third on the fore-ſide, 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 joynts. But this bone hath three proceſſes, as three feet, faſtned to the bone of the heel; of which the firſt and leaſt is under the out-ankle; the bigger (which *Galen* ſaith, makes a round head, faſtned on a long neck) looks towards the fore-part 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.

The

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.*
Figure 3 4 5 *and* 6 *shew the upper, lower, inner and outer sides of the* Talus, *or Pastern.*
Figure 7 8 9 *shew the same sides of the heel.*
Figure 10 *and* 11 *shew the forward and backward side of the boat-bone.*
Figure 12 13 *shew the fore and back-part of the wrist made of four bones.*

A B C D 3 5 6 *The protuberation of the* Talus *joyned to the appendix of the leg-bone, and of this protuberation four sides.*
E E 3 *A* Sinus *insculped in the protuberation of the* Talus.
F F 3 *Two bunching parts of the* Talus.
G 3 *The inner side of the protuberation of the* Talus *crusted over with a gristle, joyned to the inner ankle.*
H 6 *The outward* Sinus *of the protuberation of the* Talus *covered over with a gristle 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 whereto the lower part of the head of the* Talus *is joyned.*
S 4 *The lower power of the head of the* Talus *going into the* Sinus *of the heel.* T T 4 *A sharp* Sinus *of the heel receiving a gristly ligament from the Pastern-bone.* X Y Z 2 *The place of the heel.* Y Z 2 Y 8 Z 9 *A process 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 8 *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 seven and eight muscles of the foot are stretched out.* h 7 *The fore-part of the heel which is joyned to the Pastern-bone.* i 7 *That part of the heel which is joyned to the Cube-bone.* k 11 *The* Sinus *of the Boat-bone, receiving the head of the* Talus. l m n 10 *Three superfaces 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 sixth muscle of the foot is led.* s t u 13 *The plain superfaces 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 articulated to the heel.* α β 12 *The plate of the Cube-bone to which that bone of the after-wrist is joyned 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 out-side of the foot.* ε 12 13 *The superface of the cube-bone in the upper part of the foot.* ζ 2 13 *That part of the cube-bone which regardeth the earth.* η 2 *A* Sinus *of the Cube-bone at which the tendon of the seventh muscle of the foot is reflected.* Θ 13 *A process 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 after-wrist which sustaineth the great is coupled.* κ 12 *The place of the second bone of the wrist whereto the bone of the after-wrist that supporteth the fore-toe is articulated.* λ 12 *The place of the third bone of the wrist, whereto that bone of the after-wrist which supporteth the middle-toe is articulated.* μ 12 *A small bone whereby that bone of the after-wrist which sustaineth the little toe is joyned unto the cube-bone.* ν ν 12 *The distances betwixt the bones of the after-wrist.* ξ ξ 12 *The heads of the bones of the after-wrist, which enter into the bosoms of the toes.* π 2 *A process of the bone of the after-wrist wherein the tendon of the seventh muscle of the foot is implanted.* ρ 2 *a process of the bone of*

the after-wriſt, which ſuſtaineth the little toe, which proceſs receiveth the tendon of the muſcle of the foot. ς τυ 1 2 *The three bones of the fore-toe.* ♃ ☌ 2 *Two ſeed-bones placed under the bone of the after-wriſt which ſuſtaineth the great toe.* ♈ 2 *Under* X, *a ſeed-bone ſet to the ſecond joynt of the great toe.* Γ 1 2 *The* Talus *or Paſtern.* Δ 1 2 *The heel.* ☋ 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 after-wriſt.*

The deſcription of the *Calcaneum* or *Calx.*

I paſs 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 reſts when we go. It hath two upper proceſſes, the one great, the other little. The great is received in the hind and outer proceſs of the *Aſtragalus*; the leſſer is received on the inſide in the third proceſs of the ſame bone, the which we ſaid had a round head faſtned to a long neck. Beſides, it is round on the hind-part, and much diſ-joyned 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 unequal, and riſing up with many ſwellings. On the inner ſide, it makes, as it were, a channel, 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 paſs into that bone to give it nouriſhment; by reaſon of which veſſels the fracture of this heel-bone, 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 thoſe 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 bottom of a Boat. The connexions thereof are by *Synarthroſis*, and they are ſtrengthned by the fore-mentioned 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 thoſe which have names, is called *Cuboides*, from the reſemblance of a Die; although that ſimilitude be very obſcure. On the fore-part 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 joyned with the Boat-like bone, and that nameleſs bone which ſuſtains the middle toe; on the out-ſide it produces a riſing like the back of an Aſs, which on the lower part is extended tranſverſly all the length thereof; at the two ſides of this eminency, or riſing, there are two ſmall cavities, in form of a channel.

Why a fracture of the heel is ſo dangerous. *Hippocrates, Sect. 3. lib. de fractur.*

The *Os Scaphoides*, or Boat-like bone.

The *Os Cuboides* or Die-bone.

The *Oſſa innominata* or nameleſs bones.

The first and the greater of the *Oſſa innominata*, or nameleſs bones, ſuſtains the great toe; the leſſer and ſecond, the next toe thereto; the third and middle in bigneſs, the middle toe. Theſe three bones are arched on their upper part, but ſomewhat hollowed below. They are knit to the three fore-mentioned 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, makes the toes; and they are fourteen, two of the greater 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-wiſe, that the tendons which bend them, may paſs more ſtaitly and ſafely without inclining to either ſide, even to their furtheſt joynts; although ſuch paſſages are much helped by the membranous and 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 unequal in their bigneſs, that is, thick at their beginning (where they receive the heads of the precedent bones, upon which they move as a door 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 bones of the foot or *Pedium*.

The bones of the toes.

The ſeed-bones of the foot.

The *Oſſa ſeſamoides* or ſeed-bones of the feet, are like in number and ſite to thoſe 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 out-ſide, 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 joynted in the toes, as in the fingers of the hand. Beſides alſo, for that we muſt go upon our feet, Nature hath made them in ſome places hollow on the lower ſide, and in other ſome 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 twofold uſe of the feet.

CHAP.

CHAP. XXXIX.

Of the Muſcles moving the Foot.

THe muſcles of the leg moving the foot are abſolutely nine, three in the fore-part, and ſix in the hind. Two of three fore-muſcles bend the foot, when they joyntly perform their action; but when ſeverally, each draws it to his ſide; the third chiefly extends the toes, for otherwhiles 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.

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 *Digitum-tenſor*, or Toe-ſtretcher. For their original, 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, go 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 out-ſide 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 and drawing it from the reſt. *Muſculus Peronæus.*

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 four 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 middleſt; 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. *Tibiæus anticus.*

The third, which is the *Digitum-tenſor*, or Toe-ſtretcher, is twofold; the one takes its original 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 joynts 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 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 Toe-ſtretcher is two-fold.

The ſix hind-muſcles follow: of which the two firſt are called the *Gemelli*, or Twins, by reaſon of the ſimilitude of their thickneſs, original, 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 fifth the *Tibiæus poſticus*, or hind-leg muſcle, which deſcends alongſt the back-part of the leg-bone. The ſixth and laſt the *Digitum-flexor*, 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 ſix hind muſcles.

Now for the two *Gemilli*, or Twins, the one is internal, the other external; the internal paſſes forth from the root of the inner Condyle of the thigh; but the external from the external Condyle; and from this their original preſently becoming fleſhy, eſpecially on the out-ſide, 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 painful kibes. The action thereof is, to help our going by putting forth the foot, whilſt it draws the heel towards its original. The two *Gemelli* or Twin-muſcles. 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 breadth 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 go, 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 laſt being the *Digitum-flexor*, or Toe-bender, is two-fold; 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 back-ſide of the inner ankle, and from thence into the joynts 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 The *Digitum-flexor* twofold.

heel and paſtern-bone to the great toe, mixed with the precedent; their action is to bend the firſt joynt 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 dearticulation of the toes by their proper inſertion.

CHAP. XL.

Of the Muſcles moving the toes of the Feet.

Their number.

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 it original, whereupon it is called the *Abductor* of the toes, and alſo *Pediosus*, becauſe it is ſtretched over the *Pedium*, or back of the foot.

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 joynt of the four toes which it bends. Here you muſt note, that near 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 adjoyns it ſelf, 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 muſcle equivalent to the *Thenar*.

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 four *Lumbrici*.

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 deſcription of the upper and lower *Interoſſes*.

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 original, inſextion 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) are inſerted into the outward and fore-part of the following bone. The lower, on the contrary, paſs from the four 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 outwards, or to flat the foot, as we ſaid of the *Interoſſes* of the hand.

CHAP. XLI.

An Epitome, or brief recital of the bones of a mans Body.

The bones of the ſkull fourteen.

THe whole head which hath the leaſt, conſiſts of ſixty bones; but that which hath moſt, of ſixty three, that is, fourteen of the *Cranium* or ſkull, fourteen or ſeventeen of the face, and thirty two teeth: Of the bones of the ſkull there be eight containing, and ſix contained; the containing are, the *Os frontis*, or forehead-bone, the nowl-bone, the two bones of the *Synciput*, the two ſtony-bones, the wedg-bone, and the five-like or ſpongy-bone. But the contained are ſix, ſhut up in the cavity of the ears, the anvil, hammer and ſtirrop.

The bones of the face fifteen.

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 always 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 Crista*, whence the middle griſtle or partition of the noſe ariſes.

The teeth thirty two.

The two and thirty teeth are equally diſtributed in the upper and lower jaws; and of theſe there be eight ſhearers, four fangs or dog-teeth, and twenty grinders.

The bone *Hyoides*.

And there is another bone at the root of the tongue called *Os Hyoides*, always compoſed of three bones, ſometimes of four.

The bones of the ſpine thirty four.

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.

Two collar-bones.

The ribs twenty four.

The ribs are twenty four, that is, fourteen true, and ten baſtard ribs.

The bones of the *Sternon* three.

The bones of the *Sternon*, or breaſt-bone moſt frequently three, otherwhiles ſeven, as ſometimes in young bodies.

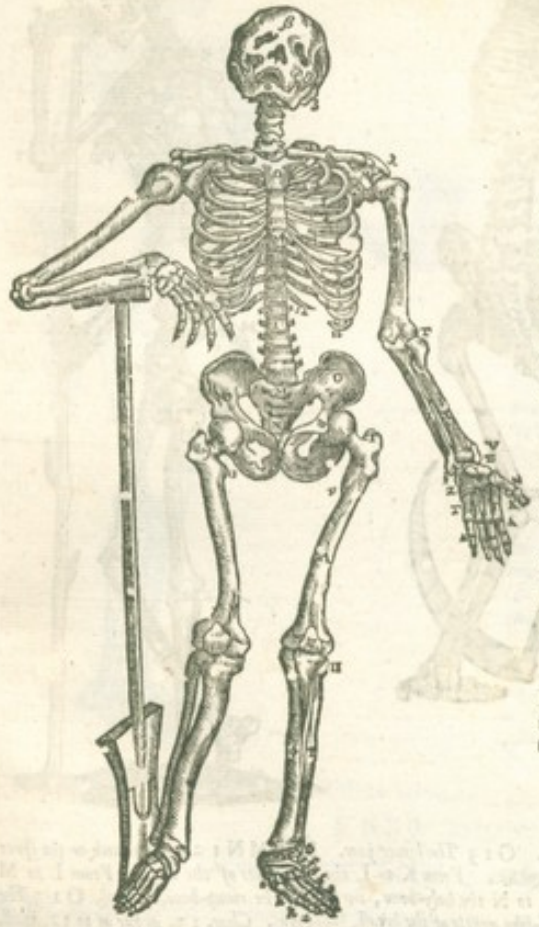
The bones of the whole arm ſixty two.

Hence coming to the arm there are reckoned ſixty two, beginning with the ſhoulder-blade, as

there

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 after-wriſt, and thirty of the fingers; into this number alſo come the *Seſamoidea*, or ſeed-bones, of which ſome are internal, and theſe always 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 external, if we believe *Sylvius*.

The firſt ſheweth the fore-part of the Sceleton of a man, &c.



The Declaration of theſe three Figures put into one.

A 3 *The coronal ſuture called in Greek* στεφανικὴ.
B 2 3 *The ſuture like the letter* λ, *called* λαμβδοειδὴς.
C 2 *The ſagittal ſure called* ὀβελιαῖα.
D 2 3 *The ſcale-like* Conjunction *called* λεπιδοειδὴς.
α 2 3 Os verticis, *or* Syncipitis, *the bone of the* Synciput, *called* Os βρεγματικὸν.
1 3 *The forehead bone, that is* μετωπιαῖον.
γ 2 3 *The bone of the nowl or* ἰνίον.
δ 1 2 3 *The bones of the temples or* κροταφῖται.
ε 3 *An appendix in the temple-bone like a bodkin,* σφηνοειδὴς.
ζ 1 2 3 *A proceſs in the temple-bone like the teat of a dug, called therefore* Mammillaris *and* μαστοειδὴς.
E 2 3 *The wedg-bone,* σφηνοειδὴς.
η 3 *The ſtony part of the ſkull.*
θ 3 *A proceſs of the wedg-bone much like the wing a Bat, and therefore called* πτερυγοειδὴς.

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 it 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 whirl-bones 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, boat-like, two die, and ſix nameleſs 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 bones of the whole leg ſixty ſix.

The

The ſecond and third Figure ſheweth the brek-ſide of the Sceleton. and the lateral part of the Sceleton.

F 1 2 3, *The yoke-bone,* ζυγωμα. G 1 3 *The lower jaw.* IKLMN 1 2 3 *The back or the ſpine* ῥαχις. *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,* ἱερον. N *The rump-bone,* κοκκυξ. O 1 3 *The breaſt-bone,* στερνον. P 1 3 *The ſword-like griſtle of the breaſt,* ξιφοειδης. *Char.* 13, *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,* ὠμοπλατης. λ 1 2 3 *The upper proceſs of the ſhoulder-blade, or the top of the ſhoulder, called* ἀκρωμιον. μ 1 3 *The lower proceſs of the ſhoulder-blade, called* ἀγκωνοειδης. 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* κερκις. Y 1 2 3 *The ell or lower-bone of the cubit, called* πηχυς. ν 3 *The proceſs of the cubit,* ὠλενοειδης. ξ 1 3 *The proceſs like a bodkin, or probe, called* σκολοειδης. ZZ 1 2 3 *The wriſt,* καρπος. ΓΓ 1 3 *The after-wriſt,* μεταβραχιον. ΔΔΔ 1 *The fingers* δακτυλοι. ⊙ 1 2 3 *The bones joyned to the ſides of the holy-bone, on each ſide diſtinguiſhed, as it were, into three parts.* ο 1 2 3 *The firſt part called the haunch-bone,* Os Ilium, λαγονων. ϖ 1 2 3 *The ſecond part of the bone of the* Coxendix, ἰσχιον. ρ 1 2 3 *The third part of the ſhare-bone,* Os pubis, ἠβης. 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 proceſs of the thigh called* Rotator, τροχαντηρ μειζων. υ 1 2 3. *His leſſer and inner proceſs.* Ξ 1 2 3 *The whirl-bone of the knee,* Patella Rotutula, ἐπιμηλις. Π Σ 1 2 3 *The leg,* κνημη. Φ 1 2 3 *The inner and greater bone of the leg,* περονη. Ψ 1 2 3 *The utter and ſmaller bone of the leg, called the Brace-bone,* Fibula, περονη. φ 1 2 3 *The proceſs of the leg, or the inner ankle, called* Malleolus internus. X 1 2 *The proceſs of the brace of the outward ankle, both of them are called in Greek* σφυρον. Ω 1 2 3 *The bone called the Cock-all,* Talus, ba liſta, Os ἀστραγαλος. a 2 *The heel* Calx, πτερνα. b 1 3 *The bone called* Os Naviculare, σκαφοειδης. cc 1 2 3 *The wriſt of the foot called* Tarſus, *conſiſting of four bones,* ταρσος. d e f. 1 2 3 *Three inner bones of the wriſt of the foot called by ſome* χαλικοειδη. g 1 2 3 *The utter bone of the wriſt of the foot like a Die, called* κυβοειδης. h h 1 2 3 *The after-wriſt of the feet called* Pedium, *by ſome* μεταταρσιον. ii 2 3 *The toes of the foot.* k 1 2 3 *The ſeed bones of the foot, called* officula ſeſamina, σησαμοειδη.

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 sagittal suture descending into the nose, and dividing the forehead-bone, which is sometimes found in women, very rarely in men, but always 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 breast-bone perforated sometimes with a hole much like the form of a heart, through which the veins do run outward, from the mammillary 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 haunch-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 larger.*

I *The Anterior commissure or conjunction of the share-bones filled up with a thick gristle, that in the birth they might better yield 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 largeness 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 natural connexion of the bones is not known; I have thought it a work worth my labour, briefly to set down, by what and how many means the bones are mutually knit and fastned together. The universal composure and structure of all the bones in a mans body is called by the Greeks *Sceletos*. But all the bones are composed after two sorts, that is, by *Arthrosis*, an Articulation or joynt, and by *Symphysis* a natural uniting or joyning together. There are many other kinds of both these sorts. For there are two kinds of Articulation, that is, *Diarthrosis*, or De-articulation, and *Synarthrosis*, or Co-articulation; which differ as thus, De-articulation is a composition of the bones with a manifest and visible motion; Co-articulation 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.

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 *Coronon*, which the Latins call *Capitulum*, a little head. But they call a deep cavity *Coyle*, 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. 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*.

What the *Sceletos* is.

Two sorts of Articulation.

What *Diarthrosis* and *Synarthrosis* are.

Three sorts of *Diarthrosis*.

What *Enarthrosis* is.

What *Arthrodia*.

What *Cephale* is.

What *Coyle* is.

What *Glene* is.

What *Ginglymos*.

Three kinds of *Synarthrosis*.

Suture

What a *Sutura* is. What *Gomphoſis* is. What *Harmonia* is.

Suture is a compoſition of the bones after the manner of ſewing 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 joyned together.

Hitherto we have ſpoken of the firſt conſtruction of the bones by articulation and the kinds thereof; now it follows we treat of *Symphyſis*.

What *Symphyſis* is.

Symphyſis or growing together, as we formerly ſaid, is nothing elſe, than natural union of the bones; ſuch union is made two manner of ways, 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 ways, by interpoſition of three ſeveral *Media*, as firſt of a griſtle, which kind of union the Greeks call *Syncondroſis*, 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 *Synneuroſis*, 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 *Synneuroſis*, or interpoſition of a nerve, in certain bones of the *Sternon* and haunch.

Syncondroſis.

Synneuroſis. The things ſignified by the word *Nerve.*

Thirdly, the bones grow into one by interpoſition of fleſh, called in Greek *Syſarcoſis*; thus the fleſh of the gums faſtens 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 Cartin* Doctor of Phyſick, which if you well obſerve it, is both blameleſs and more eaſie for your underſtanding.

Syſarcoſis.

An Epitome or brief recital 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 panicle, and covering the whole neck, and almoſt all the face. Then follow four pertaining to the upper eye-lids. In the orbs of the eyes lie fourteen, that is, ſeven in each orb, of which four are called right, two oblique, and one pyramidal. Then ſucceed four of the noſe, two external, on each ſide one, and two internal; 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 temporal; two *Maſſeteres* or grinders; two round (which ſeem to me 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 eight muſcles of the lips, that is, four of the upper, and as many of the lower, ſhutting and opening the mouth. The tongue with his ten muſcles hid, as it were, in the den of the mouth. Wherefore the muſcles of the whole face are fifty one. In the four part of the neck are found the muſcles of the bone *Hyoides* and throttle: Now eight muſcles hold the bone *Hyoides* as equally ballanced; of which there are two upper ariſing from the chin, two on the ſides from the proceſs *Styloides*, perforated in their midſt, through which the two openers of the mouth in that part nervous do paſs: two ariſe from the *Sternon*, and laſtly, two from the upper rib of the ſhoulder-blade to the *Coracoides*, which alſo in their midſt are nervous, in which place the two *Maſtoides* lye upon them.

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 conjoyned that there is no diſſimilar, nor heterogeneous 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 haunch with the buckle-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 Conjoyned by that which they call* Arthrodia, *or Articulation, as when they ſo concave and are bound together, that ſome Heterogeneous ſubſtance may be noted betwixt them, but the bones thus compoſed are knit two manner of ways; 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 Compoſition 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 buckle-bone.*
    - Arthrodia, *when in a lightly engraven and not much depreſſed cavity the head of another bone is not wholly hid, but onely 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 perpetual 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 three kinds, that is,*
    - Gomphyſis, *as when one bone ſo receives another as a pin is faſtned in the hole made by a piercer; thus the teeth are faſtned in the jaws.*
    - Sutura, *like a Saw, or teeth of a Comb; as the bones of the ſkull are mutually knit together; or as Scales, or Tiles are laid, after which manner the ſtony-bones are faſtned to thoſe 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

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 thoſe two which ſerve for the opening of the *Epiglottis*, which are always found in great four-footed Beaſts for to preſs down the *Epiglottis*. The eighteen muſcles of the *Larinx*.

The proper are twelve, which 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 are the *Maſtoidei* which bend the head.

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 head is moved by fourteen muſcles.

The neck hath eight muſcles, of which two are called the long, lying before upon the bodies of the *Vertebræ*; the two *Scaleni*, whichare at the ſides; the two *Spinati*, which run alongſt the ſpine; the two tranſverſe, which go to the tranſverſe proceſs of the cheſt. The eight muſcles of the neck.

The cheſt hath eighty one 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 midriff. 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. The muſcles of the cheſt eighty one.

Beſides, there are twenty and two external, and as many internal intercoſtal muſcles, twenty four *Intercartilaginei*, that is, twelve external, and as many internal; ſo that the intercoſtal, and *Intercartilaginei*, are ſixty eight, which with the twelve before mentioned, make the numbr of eighty muſcles. Add to theſe the midriff being without an aſſociate, and you ſhall have the number formerly mentioned, to wit, eighty one. But alſo, if you will add to theſe the muſcles of the lower belly, I will not much gain-ſay it, becauſe by accident they help inſpiration and exſpiration.

Wherefore of the eight muſcles of the *Epigaſtrium*, there are four oblique, of which two are deſcendent, and ſo many aſcendents two right, to which you may add the two aſſiſting or pyramidal muſcles which come from the ſhare-bone, if it pleaſe you to ſeparate them from the head of the right muſcles. The eight muſcles of the lower-belly.

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 Chine-muſcles. Now, that hereafter we may ſeverally and diſtinctly ſet down the muſcles of the extreme parts, we will come to the privities. The ſix or eight 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 *Peritonæum*, there are four others, partly for the commodious 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 fundament, 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 applied to the other. The three of the fundament.

Wherefore the muſcles of the arm, beginning with theſe of the ſhoulder-blade, at the leaſt, are forty two, 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 leaſt. The muſcles of the arm in general forty two.

The four 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 pectoral muſcle ariſing from the clavicle, breaſt-bone, and neighbouring ribs, draw 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 cavity of the ſhoulder-blade, 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 two-headed, 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 fourteen internal and external 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 divers 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 *Interoſſei*, although eight may be obſerved.

The whole leg hath at the leaſt fifty 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 to 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 The muſcles of the leg in general fifty.

headed muſcle, (which if you pleaſe, you may divide into three) extend it. Beſides theſe, the four twin-muſcles, and two *Obturatores*, 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 huckle-bone, but the other from the commiſſure of the ſhare-bone) the right, the two vaſt, the *Cruræus* 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 we 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 joynt of the toes alongſt the inſide of the foot; the other lends his help to the great toe, which you call the *Abductor* of the thumb, another 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 conjoyned with the muſcles.

a *The muſcle of the fore-head.*
b *the temporal muſcle.*
c *the muſcle ſtretching the eye-lid.*
d *the muſcle opening the wings of the noſe.*
e *the fore-part of the yoke-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 thereof which riſes immediately from the collar-bone, and the top of the ſhoulder.*
l *that part thereof which bends forwards to* l.
m *the muſcle which lifts up the arm.*
n *the pectoral muſcle.*
o *the membranous part of this muſcle which is joyned to the nervous part of the firſt muſcle of the* Abdomen, *or belly.*
q q *the fleſhy portion thereof, from the ſixth and ſeventh 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 great 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.*

α *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 ſtretching 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 yields tendons to the wriſt, the other to the thumb.* π *the fleſh-muſcle divided into two tendons, the one whereof is inſerted into the wriſt, lying near to the following muſcle.* ρ *a muſcle inſerted into the wriſt, lying near to the following muſcle.* σ *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 ſixth muſcle of the leg;* 2 *his beginning at* 2, *almoſt wholly membranous at* 3. 4 *the ninth muſcle of the leg.* 5 *the eighth of the leg.* 6 *a portion of the ſixth and ſeventh of the thigh.* 7 *the glandules of the groins.* 8 *the eighth of the thigh.* 9 *the ſecond of the leg.* 11 *the innermoſt of the ankle.* 12 *the ſixth muſcle of the foot, his original* 13. 14 *and* 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 end of the ſixth Book.

BOOK VII.

Of TUMORS *against* NATURE *in General.*

CHAP. I.

What a Tumour against Nature, vulgarly called an Impostume, is; and what be the differences thereof.

AN Impostume, commonly so called, is an affect against Nature, composed and made of three kind of Diseases; distemperature, ill Conformation, and Solution of Continuity, concurring to the hindering or hurting of the Action. An humour, or any other matter, answering in proportion to a humour, abolishing, weakning, or depraving of the office, or function of that part or body in which it resides, causeth it. What an Impostume vulgarly so called is.

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. The material causes of Impostumes, or unnatural tumours.

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 General 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 Felons.*
  - *Small, as those which* Avicen *calls* Bothores, i. e. *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, blue or black, and so of any other colour.*
  - *Pain, hardness, softness, and such like; from whence they are said to be painful, not painful 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, from whence a true* Erysipelas.
    - *Cold, and that either*
      - *Phlegmatick, from whence a true* Oedema.
      - *Melancholick, from whence a perfect* Scirrhus.
  - *Or,*
  - *Not Natural, which hath exceeded the limits of its natural goodness, from whence illegitimate Tumours, 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 all phlegmatick swellings and excrescences.*
    - *of a melancholick humour,*
      - *The exquisite or perfect* Scirrhus, *hardnesses, and all sort of cancerous Tumors.*
- *From the condition and nature of the parts which they possess, from whence the* Ophthalmia, *that is, a Phlegmon of the eyes.* Parotis, *a tumour near the ears.* Paronychia, *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 shall more manifestly appear by the following chapter.*

CHAP. II.

Of the general causes of Tumours.

THere are two general Causes of Impostumes, Fluxion, and Congestion: Defluxions are occasioned, either by the part sending, or receiving; the part sending discharges it self of the humours, because the expulsive faculty resident in that part is provoked to expel them; moved thereto, either by the troublesomness of their Quantity or Quality. The part receiving, draws and receives occasion of heat, pain, weakness, (whether natural or accidental) openness of the passages, and lower situation. After what manner tumours against Nature are chiefly made.

The causes of heat, in what part soever it be, are commonly three, as, all immoderate motion (under which frictions are also contained;) external heat, either, from Fire, or Sun; and the use of acrid Meats and Medicins. The causes of Heat.

The causes of Pain are four, the first is a sudden and violent invasion of some intemperate thing, by means of the four first qualities; the second is, solution of continuity, by a Wound, Luxation, Fracture, Contusion, or Distension; 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 Animal Faculty; for the mind, diverted from the actual cause of pain, is less troubled, or sensible of it. Four causes of Pain.

Two causes of weakness.

A part is weak, either by its Nature, or by some Accident: by its Nature, as the Glandules and the Emunctories of the principal 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 lowness of site yields opportunity for the falling down of humours.

Two causes of congestion.

The causes of congestion are two principally, as the weakness 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 weakness of the expulsive faculty; for, whilest the part cannot expel superfluities, their quantity continually increases.

And thus often times cold Impostumes, have their original from a gross and tough humour, and so are more difficult to cure.

Lastly, All the causes of Impostumes may be reduced to three; that is, the primitive or external; the antecedent or internal; and the conjunct or containing: as we will hereafter treat more at large.

CHAP. III.

The signs of Impostumes or Tumours in general.

The principal signs of tumours 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 knowledge must be drawn from their proper signs, the same way, as in other Diseases. But because the proper and principal signs of tumours are drawn from the essence of the part they possess, 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 depraved Function, especially when the affected part is one of those which lie hid in the Body; for we know whether or no the external parts are affected with a Tumour against Nature, by comparing that with his Natural, 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 general signs (which are known even to the vulgar) he must attentively observe such as are more proper and near. And these are drawn from the difference of the matter and humours, of which the tumours consist.

Lib. 2. ad Glauc. & 13. Method.

For this, *Galen* teaches, That all differences of Tumours arise from the nature and condition of the matter which flows down and generates the Tumour; 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 tumour, of a phlegmatick, of a melancholick, of a cholerick.

Wherefore pain, heat, redness, and tension, indicate a sanguine humour; coldness, softness, 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 knowledge 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 humours 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 bloud 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 humours, which is in the Four Seasons of the Year, is also in the Four Quarters of each Day.

The beginning of an Impostume. The increase. The state.

Impostumes which are curable have Four Times; their beginning, increase, state, and declinations; and we must alter our Medicins according to the variety of these Times. We know the beginning by the first swelling of the part; The increase, when the swelling, pain and other accidents do manifestly increase and enlarge themselves; The state when the foretaid symptoms increase no more, but each of them, because at their height, remain in their state immoveable, unless the very matter of the tumour degenerate, and change it self into another kind of humour; The Declination, when the swelling, pain, fever, restlessness, are lessened. And from hence the Chirurgeon may presage what the end of the tumour may be; for tumours are commonly terminated four manner of ways, if so be that the motion of the humours causing them be not intercepted, or they without some manifest cause do flow back into the body.

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 humour 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 humour, or both, it comes to that distemper, that it loses its proper action.

The signs of a tumor so be terminated by resolution.

It is best to terminate a tumour 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 livelinesse and itching of the part; and hot Impostumes are commonly thus terminated, because the hot humour is easily resolved, by reason of its subtilty.

The signs of suppuration.

Signs of suppuration are the intension or increase of pain, heat, swelling, pulsation, and the fever; for according to *Hippocrates*, Pain and the Fever are greater when the matter is suppurating, than when it is suppurated.

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 hardness, are the diminution of the

tumour

tumour 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 humour, and unskilfulneſs of the Chirurgeon, who by too long uſing reſolving things hath occaſioned, that the more ſubtil part of the humour 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 unskilful Chirurgeon may occaſion a Scirrhous hardneſs by another means, as by condenſating the skin, and incraſſating the humours 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 ſhall 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 ſudden diminution of the tumour, and that without manifeſt cauſe, is a ſign of the matter fallen back, and turned into the body again, which may be occaſioned by the immoderate uſe of refrigerating things. And ſometimes much flatulency mixed with the matter, although there be no fault in thoſe things which were applied.

Of diſappearance of a tumor, and the ſigns thereof.

Fevers and many other malign Symptoms; as Swoundings and Convulſion, by tranſlation of the matter to the noble parts, follow this flowing back of the humour into the body.

CHAP. IV.

Of the Prognoſtick in Impoſtumes.

TUmors ariſing from a melancholy, phlegmatick, groſs, tough, or viſcous humour, ask a longer time for their cure, than thoſe which are of bloud or choler. And they are more difficultly cured which are of humours not natural, than thoſe which are of humours yet contained in the bounds of Nature.

Cold tumors require a longer cure.

For thoſe humours which are rebellious, offend rather in quality than in quantity, and undergo the divers forms of things diſſenting from Nature, which are joined by no ſimilitude or affinity with things Natural, as Suet, Poultis, Honey, the dregs of Oil and Wine; yea and of ſolid bodies, as Stone, Sand, Coal, Straws; and ſometimes of living things, as Worms, Serpents, and the like Monſters.

Tumors made of matter nor natural, are more difficultly cured.

The tumours which poſſeſs the inner parts and noble entrails, are more dangerous and deadly, as alſo thoſe which are in the joints, or near to them. And theſe tumors which ſeize upon great Veſſels, as Veins, Arteries, and Nerves, for fear of great effuſion of bloud, 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 general Cure of Tumors againſt Nature.

THere be three things to be obſerved in the cure of Impoſtumes. The firſt is the eſſence thereof; the ſecond, the quality of the humour cauſing the Impoſtume; the third, the temper of the part affected. The firſt Indication drawn from the Eſſence, that is, from the greatneſs or ſmalneſs of the Tumor, varies the manner of curing, for the Medicins muſt be increaſed or diminiſhed according to the greatneſs of the Tumor. The ſecond, taken from the nature of the humour alſo changes our counſel, for a *Phlegmon* muſt be otherwiſe cured than an *Eryſipelas* and an *Oedema*, than a *Scirrhus*; and a ſimple Tumor, otherwiſe than a compound. And alſo you muſt cure after another manner a Tumor coming of an humour not natural, than that which is of a natural humour; 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 muſt be conſidered in undertaking the cure of tumors.

What we muſt underſtand by the nature of the part.

The temperature indicates that ſome Medicins are convenient for the fleſhy parts, as thoſe which are more moiſt; others for the nervous, as more dry; 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 pour forth the matter and humour when it is ſuppurated.

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 principal, as the Brain, Heart, and Liver; for their vertue is communicated to the whole body by the Nerves, Arteries, and Veins.

What we muſt underſtand by the faculty of the part.

Others truly are not principal, 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 endure acrid and biting Medicins. Having called to mind theſe indications, the indication will be perfected by theſe three following intentions, as if we conſider the humour flowing down, or which is ready to flow; the conjunct matter, that is, the humour impact in the part; the correction of accidents; yet ſo that we always 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 Tumour as it is then, onely excepting ſix conditions of Tumors; the

What we muſt conſider in performing the Cure.

What things diſſwade us from uſing repercuſſives.

firſt is, if the matter of the tumour be venenate: the ſecond, if it be a critical abſcefs: the third, if the defluxion be near the noble parts: the fourth, if the matter be groſs, 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 convenient diet, Purging, and Phlebotomy, muſt be appointed, frictions and bathes muſt be uſed. Ill humours are amended by diet and purging. If the weakneſs of the part receiving draw on a defluxion, it muſt be ſtrengthened.

If the part be inferiour in its ſite, let the Patient be ſo ſeated, or laid, 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 humour cauſe a defluxion, it muſt be inſpiſſate by Meats and Medicins. But for the matter contained in the part, becauſe it is againſt Nature, it requires to be evacuate by reſolving things, as Cataplaſms, Ointments, Fomentations, Cupping-glaſſes; or by evacuation, as by ſcarifying, or ſuppurating things, as by ripening and opening the Impoſtume. Laſtly, For the conjunct accidents, as the Fever, Pain, and ſuch like, they muſt be mitigated by aſſwaging, mollifying and relaxing Medicins, as I ſhall ſhew more at large hereafter.

CHAP. VI.

Of the four principal and general Tumours, and of other Impoſtumes which may be reduced to them.

What tumors may be reduced to a Phlegmon. Which to an *Eryſipelas*. Which to an *Oedema*.

THe principal and chief Tumours which the abundance of humours 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 tumours may be reduced to a Phlegmon. The *Herpes miliaris*, the eating *Herpes*, Ring-worms, and Tetters, and all Impoſtumes brought forth by choler, are contained under an *Eryſipelas*. *Atheromata*, *Steatomata*, *Melicerides*, the *Teſtudo* or *Tulpa*, *Ganglion*, Knots, Kings-Evils, Wens, Watery Ruptures, the *Aſcites* and *Leucophlegmatia* may be reduced to an *Oedema*, as alſo all flatulent tumours, which the abundance of corrupt Phlegm produces.

Which to a *Scirrhus*.

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 humour.

Now we will treat of theſe Tumors in particular, beginning with a Phlegmon.

CHAP. VII.

Of a Phlegmon.

What a true Phlegmon is. A Phlegmon one thing, and a phlegmonous Tumour another.

A Phlegmon is a general name for all Impoſtumes, which the abundance of inflamed bloud produces. That is called a true Phlegmon, which is made of laudable bloud, offending onely 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 humour, 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; always naming the tumour, from that which is predominant in it.

Therefore we muſt obſerve that all differences of ſuch tumours 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 tumour, 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 proceed *Oedematous*, *Eryſipelous*, and *Scirrhous* Phlegmons; or by corruption of its proper ſubſtance, from whence Carbuncles and all kinds of Gangrenes; 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 errour of the Phyſician; and hence oft-times happen *Atheromaes*, *Steatomaes*, 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 humour, without all admixture of any other matter; for all humours 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 tumours reſemble the nature of one ſimple humour, truly they are not of any natural humour, but from ſome humour which is corrupt, vitiated and offending in quality; for ſo bloud by aduſtion degenerates into Choler and Melancholy.

Gal. lib. de Tumoribus, &c. ad Glauc. Hippoc. lib. de Vuln. cap. Gal. lib. de Tumor. præter naturam.

Therefore a true Phlegmon is defined by *Galen*; A tumor againſt Nature, of laudable bloud, flowing into any part in too great a quantity.

This tumour, 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 part affected are filled, then the middle, and laſtly, the ſmalleſt and capillary; ſo from thoſe thus diſtended, the bloud ſweats out of the pores and ſmall paſſages like dew, and with this the void ſpaces which are between the ſimilar parts are

firſt

first filled, and 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 Tumour must necessarily follow, by reason of the repletion which exceeds the bounds of Nature; and from hence also are Tension and Resistance; and pain also happens at the same time, both by reason of the tension and preternatural heat.

And there is a manifest pulsation in the part, specially whilest it suppurates, because the Veins, Arteries, and Nerves, are much, being they are not onely heated within by the influx of the fervid humour, but pressed without by the adjacent parts. Therefore seeing the pain comes to all the foresaid parts because they are too immoderately heated and prest, the Arteries, which are in the perpetual motion of their *systole & diastole*, whilest they are dilated, strike upon the other inflamed parts, whereupon proceeds that beating pain. The cause of a beating pain in a Phlegmon

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, painful and sensible to the Patient himself; for otherwise as long as we are in health, we do not perceive the pulsation of the Arteries. *Com. 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 humours whilest 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 whilest it flows more plentifully into the part, is as it were, trodden or thrust down, and causes obstruction, from whence necessarily follows a prohibition of transpiration and putrefaction of the bloud, by reason of the preternatural heat. But the Phlegmon looks red by reason of the bloud contained in it, because the humour predominant in the part shines through the skin.

CHAP. VIII.

Of the Causes and Signs of a Phlegmon.

THe Causes of a Phlegmon are of three kinds; for some are primitive, some antecedent, and some conjunct. Primitive are falls, contusions, immoderate labour, frictions, application of acrid ointments, burnings, long staying, or labouring in the hot Sun, a diet inconsiderate, 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 Primitive causes of a Phlegmon. The Antecedent and Conjunct.

The signs of a Phlegmon are, swelling, tension, resistance, feverish heat, pain, pulsation, (especially while it suppurates) redness, and others, by which the abundance of bloud is signified. The signs of a Phlegmon.

And a little Phlegmon is often terminated by resolution, but a great one by suppuration; and sometimes it ends in a Scirrhus, or a tumour like a Scirrhus; but otherwhiles in a Gangrene, that is, when the faculty and native strength of the part affected, is over-whelmed 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 Medicins as are convenient for the nature of the Patient, and for the time and condition of the part affected. *Gal. l. de Tum.*

CHAP. IX.

Of the Cure of a true Phlegmon.

THe Chirurgeon in the cure of a true Phlegmon must propose to himself four intentions. The first of Diet; This, because a Phlegmon is a hot affect and causes a Fever, must be ordained of refrigerative and humecting things, with the convenient use of the six things Not-natural, 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 choice of that air which is pure and clear, 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, Sorrel, and Succory: let him be forbidden the use 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 allayed with Water: or, if the Fever be vehement, the Water of the Decoction of Licoris, Barly, sweet Almonds, or Water and Sugar; always having regard to the strength, age, and custom of the Patient. What kind of Diet must be prescribed in a Phlegmon.

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, especially presently after meat. Let him have his belly soluble, if not by Nature, by Art, as by the frequent use of Clysters 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 humours.

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 illness of the humours. Both which we may amend by purging and bloud-letting, if the strength and age of the Patient permit.

The pain must be aswaged.

But if the part receiving be weak, it must be strengthened with those things which by their astriction amend the openness of the passages, the violence of the humour 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 Medicins aswaging pain.

The third scope is, to overcome the Conjunct Cause. That we may attain to this, we must enter into the consideration of the tumour, according to its times, that is, the beginning, increase, state, and declination. For from hence the indications of variety of Medicins 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 Egg, Oxycrate, the Juices or Waters of Housleek, Plantain, Roses, Cataplasms of Henbane, Pomgranate, Pills, Balaustics, Bole Armenick, *Terra sigillata*, Oyl of Roses, Quinces, Myrtils, Poppies.

When we must use repercussives.

Of these simples variety of compound Medicins arises. This may be the form of a Cataplasm. ℞ *far. hordei* ʒ ij. *succi semper-vivi plantag. an.* ℥ iij. *pul. malicorii, balaustiorum & rosar. an.* ʒ ij. *ol. myrtill. & rosar. an.* ℥ i. *fiat Cataplasma.* Another, ℞ *Plantag. solani, hyoscyam. an. m.* ij. *caudæ equin. absi barb. centinodiæ, an. m.* i. *coquantur perfectè in oxycrato, passentur, trajiciantur, addendo pulveris myrtil. nuc. cupress. & ros. rub. an.* ʒ iij. *farin. fab.* ℥ ij. *olei rosar. & cydon. an.* ʒ i ß. mix them and make a Cataplasm to the form of a liquid Pultis. And you may use this liniment, by dipping linen clothes in it, and applying to the part; ℞ *ol. nymph. & rosar. an.* ℥ iij. *aq. ros. solani & plantag. an.* ʒ 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 Oyl of Roses and also *Populeon* may be used. In the increase, you must have care of the humour flowing down, and of that which already impacted in the part, did formerly fall down. Therefore repercussives must be tempered and mixed with discussing Medicins, 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.* ʒ i. *pul. rosar. rub. & Absinth. an.* ʒ i. *ol. rosar. & chamæm. an.* ʒ. i. *fiat Cataplasma ad formam Pultis satis liquidæ.* Another, ℞ *farinæ hord.* ʒ iij. *farinæ sem. lini & fœnugræci. an.* ℥ i. *coquantur in aqua communi addendo sub finem pul. myrtil. rosar. & chamæm. an.* ℥ ß. *axungiæ anseris & olei rosar. an.* ℥ i. *misce, fiat Cataplasma.*

What local Medicins we must use in the increase.

What in the state.

But in the state, the repercussives and discussives ought to be alike with some anodyns, or mitigating Medicins, if it be painful, as, ℞ *Rad. Althææ* ʒ iv. *malvæ, parietar. an. m.* ij. *coquantur sub cineribus, addendo farin. fabar. & lentium an.* ℥ ij. *pulveris cham. & meliloti an.* ʒ ß. *olei cham. & rosar. an.* ℥ i. *axungiæ gal.* ʒ ij. *fiat Cataplasma.* Another, ℞ *Micæ panis triticei aquâ calidâ macerati* ℔ ß. *pulveris rosar. rub. & absinth. ana* ℥ vj. *olei aneth. & mellis com. an.* ʒ ij. *Misce omnia simul & fiat Cataplasma ad formam Pultis satis liquidæ*; which is of chief use when there is pain.

What in the declination.

But when the violence of pain and other symptoms are aswaged, it is likely that the Phlegmon is come to determination. Wherefore then we must use more powerful and strong discussives, and only then; beginning with the more gentle, lest the subtiler part of the humour being dissolved, the grosser, remaining in the part, should grow hard, as, ℞ *Mal. bisinal. an. m.* iij. *coquantur, addendo farinæ hordei* ʒ ij. *mellis com.* ℥ i. *ol. chamæm. & melilot. an.* ʒ ß. *fiat Cataplasma.* Or, ℞ *Rad. cum Brion. & Cucumer. agrest. an.* ℥ ij. *florum chamæm. & melilot. ana m.* iij. *coquantur in hydromelite addendo farinæ, sem. lini, & fœnugræc. an.* ℥ ij. *ol. aneth. axungiæ anser. & anat. an.* ℥ i. *fiat Cataplasma.* And this Plaister following may here find place:

℞ *Diachyl. mag.* ʒ ij. *Empl. de melilot.* ʒ i. *olei aneth. & chamæmel.* ʒ ß. dissolve them all together and make a Medicin for your use. Or, ℞ *Empl. de mucag. & oxyer. an.* ʒ ij. *Empl. Diachyl. Ireat.* ʒ i. *olei liliorum & chamæmel. quantum satis est*, and make thereof a soft Emplaister.

The correction of the accidents.

The fourth scope of curing a Phlegmon consists in correction of the accidents which accompany it; of which, Pain is the principal.

The discommodities of pain.

Wherefore the Chirurgeon must be diligent to aswage 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.

Medicins aswaging pain.

According to the variety of Pain there must be variety of Medicins, as, ℞ *Micæ panis albi in lacte tepido macerati* ℔ ß. *vitell. ovorum* iij. *ol. rosar.* ʒ ij. *croci* ϑ ß. *fiat Cataplasma.* Or, ℞ *Florum chamæm. & melil. an. p.* iij. *farinæ sem. lini, & fœnugræc. an.* ℥ i. *fiat Cataplasma Pultis satis liquidæ.* Or, ℞ *Mucagin. rad. althææ & fœnugr. an.* ℥ iij. *ol. rosar. & anethi an.* ʒ i. *farin. sem. lini. quantum satis, ut inde formetur Cataplasma satis molle.*

Narcotick Medicins.

But if the pain remain, and yield 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, ℞ *Fol. hyoscyami & papav. sub. cineribus coctorum an.* ʒ iij. *adipis suillæ & ol. ros. an* ℥. i. *croci* ϑ ij. *fiat Cataplasma:* or, ℞ *Fol. cicutæ & solani furiosi, an.* ℥ iv. *coquantur sub cineribus, passentur, & trajiciantur addendo unguent. popul. & ol. rosar. an* ʒ i. *farin. fœnugræc. quantum satis erit, ut inde formetur Cataplasma ad formam Pultis liquidæ.*

CHAP.

CHAP. V.

The Cure of an ulcerated Phlegmon.

But it often happens that the humour 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 fever, and pulsation, and heaviness. The signs of a Phlegmon turning to an Abscess.

Wherefore laying aside all hope of discussing, we must come to the Suppuratives. For which purpose *Galen* foments the swollen part with Water or Oyl being Warm, or with both of them; and then applies this following Cataplasm. *Lib. 2. ad Glau. cap. 7.*

℞ *Farinæ triti. vel micæ panis* ℥ iv. *ol. com.* ℥ iij. *aquæ com. quantum sufficit fiat Cataplasma.* Or, ℞ *Rad. lilior. alb. & althææ, an.* ℥ iij. *fol. malvæ parietar. & senecionis, ana. m. i. coquantur in hydromelite, pisseatur trajectis adde farin. sem. lini* ℥ ij. *axungiæ suillæ, ol. liliorum, an.* ℥ ß. *fiat Cataplasma.* Or, ℞ *Malvæ, bismalv. violar. an. m. i. caricarum pinguium. 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, ℞ *Empl. Diachylon mag.* ℥ iij. *ung. basilicon.* ℥ i. *ol. liliorum* ℥ ß. Of these mixed together make a Medicin for the foresaid use. Suppurative Medicins.

When the heat, pain, fever, and other accidents shall remit, when the tumour hath a sharp head, when by the pressing of your finger you find the humour to flow, as it were, to and fro, then you may know that it is ripe. The signs of *Pus*, or matter

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.

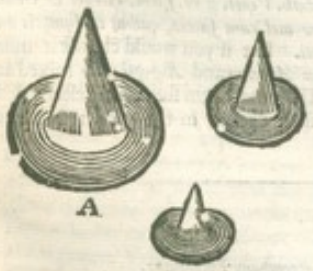
For this usually happens, especially then, when the matter is venenate or malign, or when the swelling is near a Joint, or at the Fundament, or such like hot and moist places.

For by the decree of *Hippocrates* we should anticipate the maturation of such Tumours by opening. *Hip. lib. de Fistula.*

They may be opened with an Incision-knife, or Caustick, and that either actual, or potential. For if the Patient shall be heartless and less confident, so that he either cannot, or will not endure any Instrument, you must make way for the matter by a Potential Cautery. You may also do the business by another slight; as thus:

Thrust the point of a sharp 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 if 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.

B *Counters with the points of Knives or Lancets put through them.*



A *Shews the Counter or piece of Silver.*
B *Shews the point of the Lancet.*

A

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 yields to the impression of your fingers, and where it rises into a head or point. The second is, That you make choice of that place for dissection which is the lowest, that so the contained impurity may the more readily flow out, and not stay in the passage. The third is, That it be made according to the wrinkles 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 humour. 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 Tumour remains, all the contained humour being not wholly suppurated, the Chirurgeon may perceive that this is an implicit affect, that is, a Tumour and Ulcer. But the Cure thereof must be so, that you take away the Tumour 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 days with this following Medicin. What the cure must be after the opening of the abscess.

Other

Other Instruments for opening Abscesses.

Rings in which little Knives lie hid, fit for to open Abscesses.

The Delineation of a Trunk or hollow Instrument going with a Spring.

A *Shews the thicker Pipe.*
B *Shews another, which enters and is fastned in the other by a Screw.*
C *The point of the Instrument looking out.*
D *The spring which forces the Instrument.*

Detersive Medicins.

℞. *Vitellum unius ovi, terebinth. Venet. & ol. Rosar. an.* ℥ ß, *fiat medicamentum.* Then you must seek to cleanse it by this following Medicin.

unguentum de Apio.

℞ *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 *Apium* or Smallage, of which this is the description.

℞ *Succi apii, plantag. beton. an.* ℥ i. *Mellis commun.* ℥ v. *terebinth. Venet.* ℥ iv. *farin. Hordei & Orobi, an.* ʒ ij. *pulveris Aloes, rad. Ireos florent. myrrhæ, an.* ʒ 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 *Unguentum Apostolorum*, or *Unguentum 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.

CHAP. XI.

Of Fevers and the Cures of those Fevers which accompany Phlegmons.

The Fever of a Phlegmon. What a Fever is.

AMongst the *Symptoms* which most usually accompany Phlegmons, and afflict all the body of the Patient, Fevers are the chief; that is, hot and dry distempers kindled in the heart, and thence by the Arteries sent over all the body; yet those which usually follow this kind of Tumours, are *Ephemeræ*, 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 practice 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 vital spirits. It hath that name, because by its own nature it tarries not above the space of one day, or twenty four hours, by reason it is kindled in a subtile easily dissipable matter.

The causes thereof.

The efficient causes of this Fever are weariness, hunger, and drunkenness, anger, fury, sorrow, watching, great and piercing cold, Adustion, Bathes, and manner of living inclining more to heat then ordinary; applying, using or drinking of acrid Medicins, as Poisons, or of hot Meats, or drinks; to conclude, all the efficient causes common to all Fevers, putrefaction onely excepted, which properly appertains to putrid Fevers.

Aphorism 55. *lib.* 4.

For a *Bubo* also, which is a Phlegmon of the Glandules, causes a Diary, as *Hippocrates* shews. All Fevers proceeding from the Tumours of the Glandules are evil, the Diary excepted. Which *Aphorism* must be understood warily and with that distinction which *Galen* gives in his Commentary, where he saith; It is not onely to be understood of Tumours rising in the Glandules without occasion, that is, without any evident and manifest cause; for otherwise Fevers that thence take their original,

original, though not Diary, yet are not all evil, 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 Fever accompanying them, which thing is worthy a Chirurgeons observation.

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 Fever proceed from sorrow, hunger, cold, crudity; for other respects equal and ordinary. The signs of a Diary.

The most certain signs are, if the Fever come upon one not by little and little, but suddenly, and that from external and evident cause; no loathing of Meat, no causless weariness, no deep sleep, yawning, great pain, restlessness, shaking, nor cold going before; and lastly, no other troublesom symptom preceding. We here make no mention of the Urin, because most frequently they resemble the Urins of sound bodies; for in so short a time as Diaries endure, there cannot so great a perturbation be raised in the blood that there may be signs thereof found in the Urine. A Diary is ended in one fit, which by the proper nature of this Fever lasts but one day, although sometimes otherwise it is extended to three or four days space; and then it easily degenerates into a Putrid, especially any errour of the Patient, Physician, or those which attend him, concurring therewith, or if the external things be not rightly fitted. Why in a Diary the Urin is like to those in health.

This Fever is terminated either by insensible transpiration, or by the moisture of the skin, or by a sweat natural, gentle, and not ill smelling; to this Diary we may refer the unputrid *Synochus* generated of blood not putrid, but onely heated beyond measure. For usually there arises a great heat over all the body, by means of the blood 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 blood, 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 Fever. To this Children are incident; as also all sanguin bodies, which have no ill humours. The cure of this and the *Ephemera*, or Diary is the same; because it may scarce seem different from the *Ephemera* in any other thing, than that it may be prolonged for three or four days. Wherefore whatsoever we shall say for the cure of the *Ephemera*, may be applied to the *Synochus*, blood-letting excepted, which in an unputrid *Synochus* is very necessary. The unputrid *Synochus*.

Now the cure of a Diary-Fever consists in the decent use of things Not natural, contrary to the cause of a disease; wherefore Baths of warm and natural Water are very profitable, so that the Patient be not Plethorick, nor stuffed with excrements, nor obnoxious to Catarrhs and Defluxions, because a Catarrh is easily caused and augmented by the humours 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 useful in these kind of Fevers, especially when they have their original from extreme labour, by attriction of the skin, or a *Bubo*. Let this be a general rule, that to every Cause whence this Fever proceeded, you oppose the contrary for a remedy; as to labour, rest; to watching, sleep; to anger and sorrow, grateful society of Friends, and all things replenished with pleasant good will; and to a *Bubo*, the proper cure thereof. The cure of a Diary Fever.

Wine moderately tempered with Water according to the custom of the sick Patient, is good and profitable in all causes of this Fever, except he be pained in his head, or that the Fever drew its original from anger, or a *Bubo*; for in this last case especially, the Patient must abstain wholly from Wine, until the inflammation come to the state, and begins to decline. This kind of Fever often troubles Infants; and then you must prescribe such Medicins 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 natural and warm Water, and presently after the Bath to anoint the ridg of the Back and Breast with Oil of Violets. But if a Phlegmon possess any inward part, or otherwise by its nature be great, or seated near any principal Bowel, so that it may continually send from it either a putrid matter or exhalation to the heart, and not onely affect it by a quality of preternatural heat by the continuity of the parts, thence will arise the putrid *Synochus*, if the blood by contagion putrefying in the greater Vessels, consists of one equal mixture of the four humours. This Fever is thus chiefly known: it hath no exacerbations, or remissions, but much less intermissions; it is extended beyond the space of twenty four hours, neither doth it then end in vomit, sweat, moisture, or by little and little insensible transpiration, after the manner of intermitting Fevers or Agues; but remains constant, until it leaves the Patient for altogether: it commonly happens not, unless to those of a good temper and complexion, which abound with much blood, and that tempered by an equal mixture of the four humours. It commonly endures not long, because the blood by some peculiar putrefaction degenerating into Choler or Melancholy, will presently bring forth another kind of Fever, to wit, a Tertian or continued Quartan. The use of Wine in a Diary. How a putrid *Synochus* is caused.

The cure of this Fever (as I have heard of most learned Physitians) chiefly consists in blood-letting. 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 Fever there is not onely a fault of the matter, by the putrefaction of the blood, but also of the Temper by excess of heat; certainly Phlebotomy helps not onely, as we said, the putrefaction, but also the hot distemper. For the blood in which all the heat of the creature is contained, whilest it is taken away, the acrid and fuliginous excrements exhale and vanish away with it, which kept in, increase the Feverish 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 Fever. Phlebotomy necessary in a putrid *Synochus*.

This moved the ancient Physicians 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

Yet because thus, not a few have poured out their lives together with their bloud, it will be better and safer to divide the evacuations, and draw so much bloud at several times, as the greatness of the disease shall require, and the strength of the Patient may bear.

Why we must give a Clyster presently after bloud-letting.

When you have drawn the bloud, forthwith inject an emollient and refrigerative Clyster; lest that the Veins emptied by Phlebotomy may draw into them the impurity of the Guts; but those 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 onely a refrigerative quality, but also to resist putrefaction, such as the Syrup of Limmons, Berberies, of the Juice of Citrons, of Pomegranats, Sorrel and Vinegar; let his diet be absolutely cooling and humecting, and also slender; for the native heat much debilitated by drawing of great quantity of bloud cannot equal a full diet. Therefore it shall suffice to feed the Patient with Chicken and Veal Broths made with cooling Herbs; as Sorrel, Lettuce, and Purslan. Let his drink be Barly Water, Syrrup of Violets mixed with some pretty quantity of boiled Water, *Julepum Alexandrinum*, especially if he be troubled with scouring or lask. 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 seventh day, and that either by a loosenes of the belly, or an abundance of Urin, by Vomits, Sweats, or Bleeding. Therefore we must then do nothing but commit the whole business to Nature.

When Syrrups profitable in this case.

Why a slender Diet must be used after letting much bloud.

When drinking of Water is permitted in a putrid *Synochus*.

But for drinking cold Water, which is so much commended by *Galen* in this kind of Fever, 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.

CHAP. XII.

Of an Erysipelas, *or Inflammation.*

The definition of an *Erysipelas*.

HAving declared the cure of a Phlegmon, caused by laudable bloud; we must now treat of those Tumors which acknowledge Choler the material cause of their generation, by reason of that affinity which intercedes between Choler and Bloud. Therefore the Tumors caused by natural 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 bloud (which upon any occasion of inflammation easily becomes Cholerick) or by bloud and Choler, hotter then is requisite, and sometimes of choler mixed with an acrid serous humour.

Gal. cap. 2. lib. 14. Meth. med. & 2. ad Glauc.

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 humours. For if it being predominant be mixed with bloud, 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 humour bearing dominion, but the latter or adjective that which is inferiour in mixture. But if they concur in equal quantity, there will be thereupon made *Erysipelas Phlegmone, Erysipelas œdema, Erysipelas scirrhus*.

Two kinds of *Erysipelats*.

Galen acknowledges two kinds of *Erysipelaes*, one simple and without an ulcer, the other ulcerated. For choler drawn and severed from the warmnes of the bloud, running by its subtilty and acrimony unto the skin, ulcerates it; but restrained by the gentle heat of the bloud, as a bridle, it is hindered from piercing to the top of the skin, and makes a tumour without an ulcer. But of unnatural 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 *Erysipelas* chiefly by three signs, as by their colour, which is 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 humour and the outward site of it under the skin, (whereupon by some *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 less; for as the heat of the bloud 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. Hip. Aph. 79. Sect. 7. Aph. 25. Sect. 16. Aph. 43. Sect. 3.

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 heavinels; 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 affails the Face, by reason of the rarity of the skin of that place, and the lightnes of the cholerick humour 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 humour, whence there is some danger of erosion in the parts next under the skin.

It is good when *Erysipelas* comes from within outwards, but ill when from without it retires inward. But if an *Erysipelas* posses 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.

CHAP. XIII.

Of the Cure of an Erysipelas.

FOr the cure of an *Erysipelas* we must procure two things, to wit, Evacuation and Refrigeration. But because here 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. First of all, we must appoint a convenient manner of Diet, in the use of the six things not natural; 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 bloud mixed with choler, if the *Erysipelas* possess the face, and if it be spread much over it. *Gal.* 14. *Meth.* Four things to be performed in curing an *Erysipelas.*

But if it shall invade another part, although it shall proceed of pure choler, Phlebotomy 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 will 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. In what *Erysipelas* it is convenient to let bloud, in what noe.

The third care must be taken for Topick, or local Medicins, which in the beginning and increase must be cold and moist, without any either drinesse or astriction, because the more acrid matter by use of astringent things being driven in, would ulcerate and fret the adjacent particle. What Topick Medicins are fit to be used in the beginning of an *Erysipelas.*

Galen and *Avicen* much commend this kind of remedy; Take fair Water ℥ vj. 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. Pfyll'ii* ℥ ij. *succi hyoscyami* ℥ i. *Misce.* But if it the *Erysipelas* be upon the face, you must use the Medicin following,

℞ *Unguent. Ros.* ℥ iv. *succi plantagin. & sempervivi, an.* ℥ i. *trochisc. de Camphora* ℥ ß, *aucti parum*; let them be mixed together and make a liniment. But if the heat and pain be intolerable, we must come to narcotick Medicins. As, ℞ *Succi hyoscyami, solani, cicutæ, an.* ℥ i. *album ovorum n* ij. *aceti* ℥ ß, *opii & Camphor. an. gra.* iv. *croci* ℈ ß, *Mucaginis sem. pfyll. & fænigr. extractæ in aq. ros. & plantag. an* ℥ i. *ol. de papav.* ℥ ij. *fiat linimentum, addendo aq. refrigerantis Gal. camphor. q. satis sit.* Yet we must not use such like Medicins too long, lest they cause an extinction of the native heat and mortification of the part.

Wherefore such Narcotick Medicins must be used with regard of place, time, and such other circumstances. Therefore we may three manner of ways understand when to desist from using Narcotick or Stupefactive Medicins. 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 wax 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 sem. lini* ℥ i ß, *coquantur in Hydromelite vel oxycrato, addendo pulv. rosarum & chamæmel, an.* ℥ ij. *farinæ fom. 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. meliloti, rosar. rub. an.* m. ij. *coquantur in æquis partibus vini & aquæ, & fiat fotus cum spongiis.* After the fomentation, you may apply an Emplaister of *Diachylon Ireatum*, or *Diapalma* dissolved in Oyl of Chamomile and Melilote, and such other like. The fourth Intention which is of the correction of accidents, we will perform by those means which we mentioned in curing a Phlegmon, by varying the medicaments, according to the judgment of him which undertakes the Cure. What caution must be had in the use of Narcotick Medicins. Resolving and strengthening Medicins.

CHAP. XIV.

Of the Herpes; *that is, Tetters, or Ring-worms, or such like.*

HErpes is a tumour caused by pure choler separated from the rest of the humours, that is carried by its natural lightness and tenuity even to the outer or scarf-skin, and is diffused over the surface hereof. *Galen* makes three sorts of this tumour. For if perfect choler of an indifferent substance, that is, not very thick, cause this tumour, then the simple *Herpes* is generated, obtaining the name of the *Genus*; but if the humour 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 Tumour 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 a *Herpes* is, what be the kinds thereof. *Gal.* 2. *ad Glauconem.* What the *Herpes miliaris* is. What the *exedens.*

There 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 Medicins purging the peccant humour, for which purpose oft-times Clysters will suffice, especially if the Patient be somewhat easie by Nature, and if the Urin flow according to your desire; for by this a great part of the humour may be carried into the bladder; The third shall be to take away the conjunct cause by Local Medicins ordained for the swelling and ulcer: Therefore the Chirurgeon Three intentions in curing *Herpes.*

A rule for healing Ulcers conjoined with tumours.

rurgion ſhall have regard to two things, that is, the reſolving of the tumour, 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 tumour, which if it be performed, there can be no hope to heal the ulcer; he ſhall lay this kind of medicine to diſſolve and dry, as, ℞ *Cerueſæ & tuthiæ prepar. an.* ʒ j. *ol. roſ. & adipis capon. an.* ʒ ij. *corticis pini uſti, & loci* ʒ ß, *ceræ quantum ſatis, fiat unguentum.* Or, ℞ *Farinhord. & lent. an.* ʒ ij. *coquantur in decocto corticis mali granati, balauſt. plantag. addendo pulveris roſar. rub. abſinth. an.* ʒ ß, *olei Myrtillor. & mellis com. an.* ʒ vj. *fiat unguentum, ut artis eſt.* But for an *Herpes Miliaris* theſe muſt chiefly be uſed, ℞ *Pulv. gallarum, malicorii, balauſt. boli armeni an.* ʒ i. *aquæ roſ.* ʒ iij. *aceti acerrimi* ʒ i. *axungiæ anſeris & olei Myrtillor. an.* ʒ i ß *terebinth.* ʒ i. *fiat unguentum ad uſum.* I have often found moſt certain help in *unguentum exulatum cum Mercurio*, for it kills the Puſtules, and partly waſtes the humour contained in them. Yet if the Ulcer not yet neither yields, but every day diffuſes it ſelf further and further, you ſhall touch the edges and lips thereof with ſome acrid medicin, as *Aqua fortis*, Oil of Vitriol, or ſuch like, for by this kind of remedy, I have oft-times healed fretting Ulcers, which ſeemed altogether incurable.

The force of *unguentum exulatum cum Mercurio.*

Medicines fit for reſtraining eating and ſpreading Ulcers.

CHAP. XV.

Of Fevers, which happen upon Eryſipelous Tumors.

A vulgar deſcription of an intermitting Tertian Fever.

AS Fevers ſometimes happen upon Inflammations, and Eryſipelas, which favour of the humour 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 Fevers, 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 Fevers.

The primitive cauſes in general are ſtrong exerciſes, eſpecially in the hot Sun, the uſe of heating and drying either Meats or Medicins, great abſtinence joined with great labour, care, ſorrow; the antecedent cauſes are the plenty of choler in the body, and hot and dry diſtemperature either of the whole Body, or of the Liver onely: the conjunct cauſe is the putrefaction of the cholerick humour 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 humour 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 Fever kindled like a Fire in dry Straw; the Pulſe is great, quick and equal, the Tongue dry, the Urine yellowiſh, red and thin. The Symptoms are watchings, thirſt, talking idly,

The Symptoms.

anger, diſquietneſs and toſſing the body at the leaſt noiſe or whiſpering. Theſe Fevers are terminated by great Sweats. They are incident to cholerick young Men, ſuch as are lean, and in Summer;

Why Tertians have an abſolute ceſſation of the Fever at the end of each fit.

after the Fit oft-times follow cholerick Vomiting and yellowiſh Stools. After the Fit there follows an abſolute intermiſſion retaining no reliques of the Fever, until 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 natural levity and facility; whereas in Quotidians there is no ſuch thing, as which after the Fit always leave in the body a ſenſe and feeling of a certain inequality by reaſon of the ſtubbornneſs of the Phlegmatick humour and dulneſs to motion. The Fit commonly uſes to endure 4, 5, or 6 hours, although at ſome time it may be extended to 8 or 10. This Fever is ended at 7 Fits, and uſually is not dangerous, unleſs there be ſome errour committed by the Phyſitian, Patient, or ſuch as attend him. Tertians in Summer are ſhorter, in Winter longer.

Wherefore the beginning of the Fit is accompanied with ſtiffneſs, 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 Fever, 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 onely then, when the cholerick humour cauſing the Fever 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, carried 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 natural, that it may incline to refrigeration and humectation, as much as the digeſtive faculty will permit, as Lettuce, Sorrel, Gourds, Cucumbers, 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 hours before the Fit, leſt the Aguiſh heat lighting on ſuch Meats as yet crude, may corrupt and putrifie them; whence the matter of the Fever 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 humour; 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 onely before the Fit, but alſo in the Fit it ſelf; but that onely ſparingly, leſt the ſtrength ſhould be too much impaired.

When to purge the Patient.

Now for Pharmacy; It muſt be conſidered, whether the ſtrength of the Patient be ſufficient, if the humours abound; for then you may preſcribe *Diapruanum ſimplex*, *Caſſia* newly extracted, the decoction of Violets, of Citrin Myrobalanes, Syrups of Violets, Roſes, of Pomegranats and Vinegar. But if the powers of the Patient languiſh, he muſt not onely not be purged, but alſo muſt not draw

bloud

bloud too plenteouſly, becauſe Cholerick men ſoon faint by reaſon of the facile and eaſie diſſipation of the ſubtile humors and ſpirits; beſides, ſuch as are ſubject to Tertian Fevers do not commonly abound with bloud, unleſs it be with cholerick bloud, which muſt rather be renewed, or amended by cooling and humecting things, than evacuated. Yea verily, when it is both commodious and neceſſary to evacuate the body, it may be attempted with far more ſafety by ſuch things as work by inſenſible tranſpiration, which provoke Sweats, Vomit, or Urin, by reaſon of the ſubtlety of the cholerick humour, than by any other. Alſo the frequent uſe of emollient Clyſters 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 drineſs of the head, with a particular exceſs of the cholerick humor, the head muſt be cooled by applying to the Temples and Fore-head, and putting into the Noſe Oil 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 Oil of Violets, and ſuch like.

In the declining, a Bath made of the branches of Vines, the leaves of Willows, Lettuce, and other refrigerating things boiled in fair Water, may be profitably uſed three hours 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 general, that the humours 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 humours peradventure tough and groſs, no evacuation going before. When the time is fit to uſe a Bath.

Alſo it will be good after general purgations to cauſe ſweat by drinking White Wine, thin and well tempered with Water; but Urin by a decoction of Smallage and Dill. Certainly Sweat is very laudable in every putrid Fever, 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 ſubtlety is eaſily reſolved into ſweat. But that the ſweat may be laudable it is fit it be upon a critical day, and be fore-ſhewed 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, Graſs, Roots, and the like opening things; but by things outwardly applied, and Sponges dipped in a decoction of hot Herbs (as Roſemary, Thyme, Lavender, 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 thighs. Then let this be the bound of Sweating, when the Patient begins to wax 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 Fever, according to the opinion and preſcription of *Galen*; for ſeeing this Fever for the moſt part is terminated at ſeven Fits, if you ſtay until the third Fit be paſt, the Fever 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 bloud 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 onely two, an *Oedema*, and a *Scirrhus*. And for all that *Hippocrates* and the Ancients uſed the word *Oedema* for all ſorts of Tumors in general; yet by *Galen* and thoſe Phyſicians which ſucceeded him, it hath been drawn from that large and general ſignification, to a more ſtrait and ſpecial, onely to deſign a certain *ſpecies* or kind of Tumor. *Gal. lib. de tum. præter natur.*

Wherefore an *Oedema* is a ſoft, lax, and painleſs Tumor, cauſed by collection of a Phlegmatick humour. What an *Oedema* is.

The Ancients made eight differences of Tumors proceeding of Phlegm: The firſt they termed a true and lawful *Oedema* proceeding from natural Phlegm; from unnatural Phlegm by admixtion of another humour they would have three ſorts of Tumors to ariſe; as that, by mixture of bloud, ſhould be made an *Oedema Phlegmonodes*, and ſo of the reſt. The differences of *Oedema*.

Beſides, when they perceived natural Phlegm either puffed up by flatulency, or to flow with a watriſh moiſture, they called ſome *Oedemaes* flatulent, others watriſh; 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 *Meliceriden*, as laſtly, they called that kind of *Oedema* which is cauſed by putrid and corrupt Phlegm, *Scrophule*. For we muſt obſerve that Phlegm ſometimes is natural, and offends onely in quantity; whence the true *Oedema* proceeds: otherwhiles it is not natural, and it becomes not natural, either by admixtion of a ſtrange ſubſtance, as Bloud, Choler, or Melancholy, whence ariſe the three kinds of *Oedemaes* 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 watriſh Tumors, as the *Hydrocele*, *Pneumatocele*, and all kinds of Dropſies. By how many ways Phlegm becomes not natural.

The cauſes of all *Oedemaes* are the defluxion of a Phlegmatick, or flatulent humour 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 Cauſes.

The ſigns are a colour whitiſh and like unto the skin, a ſoft Tumor, rare and lax by reaſon of the plentiful The Signs.

plentiful moisture with which it abounds, and without pain, by reason this humour 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 humour and slowness to motion. *Oedemaes* 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 looseness to receive a defluxion; for the same cause, bodies full of ill humours, ancient, and not exercised, are chiefly troubled with this kind of Tumor.

The Prognosticks.

How *Oedemata* 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 humour.

A Symptomatical *Oedema*, as that which follows upon a Dropsie, or Consumption, admits no cure unless the Disease be first taken away.

The intentions of curing *Oedemata*.

The general cure is placed in two things, that is, in evacuation of the conjunct, and matter prohibiting the generation of the antecedent. We attain to both, chiefly by four means.

The first truly by ordaining a fit manner of living and prescribing moderation in the use of the six things not natural. Wherefore we must make choice of such air as is hot, dry, and subtle; we must

The Diet.

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 boiled. 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 Dridge 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 humour, and restore the native heat. Let him sleep little, because much sleep breedeth cold humours; let him avoid grief and sadness. And if he be of a weak body, let him abstain from Venery, lest by another weakning

What to be observed in the use of Venery.

by the use of Venery added to his present infirmity, he fall into an incurable 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 dried and heated.

6. Epid. sect. 5. sect. 23.

For so that sentence of *Hippocrates* is to be understood; That Venery is a cure for Phlegmatick Diseases, as *Galen* in his Commentaries tells us. The Physician may perform the second intention by turning his counsel to that part, from whence the Spring of Phlegmatick humour 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 Medicins be prescribed. We perform the third intention by evacuating the humour impact in the part with local Medicins varied according to the four times of the Tumor.

Lib. 2. ad Glauc. cap. 3. A Rowler.

For *Galen*, in the beginning and increase, prescribeth a fomentation of *Oxycratum* 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 Medicins following are very fit for the same purpose, ℞ *Lixivii ex cineribus sarmentorum, & caulium, an.* ʒ iv. *Tartari & Aluminis an.* ℥ ß. *aceti* ℥ ij. mix all together and make a decoction, wherein wet Sponges and foment the place. Also you may use the following Cataplasm, ℞ *Farinæ hordei* ℥ iv. *coquantur in Lixivio communi, addendo pulveris nucis cupressi, corticum granatorum, balaustii, an* ʒ i. *Myrrhæ, Aloes, alum. an.* ℥ ß. *olei Myrtill.* ℥ ij. *fiat Cataplasma.* In the state and declination, you must use drying and resolving Medicins, as, *Nucum cupressi, granat. sumach. balaustii, an.* ʒ i. *Salviæ, origan. calament. Hyssopi, melissæ, an. m.* i. *absinthii, plantag. caudæ equ. tapsi. barb. centinod. an. m. ss. alum. tartar. & salis com. an.* ʒ i. *coquantur cum lixivio*; foment it with a Sponge, then presently apply this following Cataplasm. ℞ *Rad. Brioniæ* ℥ ij. *absinth. plantag. centin. chamæm. meliloti peleg. an. m. ss. coquantur in hydromelite, pistentur, trajiciantur, addendo pulveris ros. rub. chamæm. melil. an.* ʒ i. *fiat Cataplasma.*

What caution to be had in application of Emplaisters.

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 scarcely do their duty, by reason of the great coldness of the part, being not sufficient of it self to assimilate the nourishment, or to expel the superfluous and unprofitable humour. Let a fomentation be made with white Wine, in which Sage, Rosemary, Thyme, Lavender, Chamomile and Melilot flowers, red Roses, Orris roots, *Stœchas*, and such like have been boiled, with a little Vinegar added thereunto. Quench hot Bricks in the same decoction, and apply them wrapped in linnen cloths to the affected part, for so vapours will breath forth, which hath an attenuating, piercing, resolving and strengthening faculty. But you may, in stead of the Bricks, fitly apply Hogs or Ox bladders, filled half full with the foresaid decoction, and that hot. The frictions must be made of hot linnen cloths, for so the native heat together with the bloud and spirits is recalled to the part, and fuliginous humours contained under the skin are resolved, whereby the strength of the part is in some part recovered.

CHAP. XVII.

Of the Cure of flatulent and Watersh Tumours.

In what place Flatulencies may be gathered.

I Formerly declared that not onely flatulent and watersh 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 *Periosteum* and *Pericranium*, whereupon ensues cruel torment by reason of the distention of those parts which are indued with most exquisit sense. Sometimes the Entrails, as the Stomach and Guts are swollen and stretched out with wind, as in a Tympany.

They

They in this differ from a true and legitimate *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 humour, for the vapour being pressed returns speedily again, as you may perceive by balls or bladders filled with wind. In what flatulent tumours differ from a true *Oedema*.

The cause of such tumours is the weakness of the native heat, not being able easily to resolve and waste the Phlegm by which the windy Tumours 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 inflammations, or swellings. But oft-times although the native heat be sufficiently powerful, yet because the humour lieth 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 increased by little and little it causes a Tumour. The causes of flatulent tumours.

The signs of such a Tumour 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 Tumour 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 distension is so great, that Death ensues by reason of the renting or tearing the Coats of the Guts. The signs of such tumours.

CHAP. XVIII.

Of the Cure of a flatulent and watrish Tumour.

WE shall chiefly and principally cure flatulent and watrish Tumours 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 the good liking of the Physitian which over-sees the Cure; lastly by taking away of the conjunct matter by hot, drying, and attenuating Medicins which they call Carminative, that so the part being rarified, the humour and flatulency therein 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 applied to the Stomach, others to the Guts, others to the Joints, and others to the fleshy parts: for the Colick you must inject carminative Clysters, let resolving *Sacculi* or Bags be applied, and Cupping-glasses fastened to the Navel; if an outward part be affected, we use fomentations, liniments, chiefly if pain torment, as also Cataplasms and Emplasters, as ℞ *Florum chamæm. melil. rorismarini, rosar. rub. an. p. i. absinthii* ij. *hyssopi, an.* m. let them be boiled in Lye, adding a little Vinegar for a fomentation to be used with Sponges. Diet. Things strengthening the parts. Medicins evacuating the conjunct matter.

Galen foments the part with Rose-vinegar and a little Salt put thereto, and would have a Sponge dipped therein to lie somewhat long upon the part, ℞ *Olei chamæm. anetb. rut. & liliorum, an.* ℥ ß. *ceræ albæ* ℥ vj. *aq. vitæ* ℥ i. 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 chamæm. & melilot. an. m. ſ. fiat ſer farinæ. fab. & orobi, an.* ℥ ij. *coquatur cum lixivio communi, addendo terebinth.* ℥ iij. *oleor. anetb. & rut. an.* ℥ ij. make an emplaister for the foresaid use. *Galen*'s fomentation.

The Emplaister of *Vigo*, with *Mercury*, and without, is very good for the same purpose. But you must note, that such Medicins must be applied to the part actually hot, and the same heat must be contained and renewed by putting about it linen Clothes, Bricks, Bottles, and such like hot things.

The humour and flatulency which were kept shut up in the part being resolved, the part must be strengthened, lest now and then it receive or generate the like matter. That may be done by the following fomentation and cataplasm. ℞ *Nucum cupress, corticum granat. stomach. berberis, balaust. an.* ℥ i. *caudæ equin. arnoglos. tupsi barb. absinth. salviæ, rorism. lavendul. m. ſſ. flor. chamæm. melil. rosar. anthos. an. p. i. alum. salis com. an.* ℥ ß. *bulliant omnia in æquis partibus aquæ fabrorum & vini austeri*, make bags for a fomentation, or use the decoction for the same purpose with a Sponge. ℞ *Farinæ fab. hordei & lupin. an.* ℥ ij. *terebinth. commun.* ℥ iv. *pulv. radicis iridis, mastic. an.* ℥ ß. *mellis com.* ℥ ij. ß. of the aforesaid Decoction as much as shall suffice, so to make a Cataplasm to the form of a Poultis liquid enough; let it be applied hot to the affected part having used the fomentation before. Corroborating Medicins.

The signs of a watrish tumour 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 of murmur as of a bladder half filled with Water. The signs of a watrish tumour.

Therefore the watrish tumour if it shall not yield to the fore-mentioned resolving Medicins, the way must be opened with an Incision-Knife, after the same manner, as we mentioned in a Phlegmon. For often-times this kind of remedy must be necessarily used, not onely by reason of the contumacy of the humour which gives no place to the resolving Medicins, but also because it is shut up in its proper cist or bag, the thickness of which frustrates the force of the resolving Medicins, neither suffers it to penetrate into the humour. As I some years ago found by experience in a Maid of 7 years old; which troubled with a *Hydrocele*, or watrish Rupture, to whom, when I had rashly applied to dissolve it with resolving Medicins of all sorts, at length I was forced to open it with my knife, not only to evacuate the contained matter, but also that I might pluck out the bag, which unless it were cut up by the root, would be a mean to cause a relapse. *John Altine* Doctor of Physick called me to this business. *James Guillemeau* the Kings Chirurgeon over-saw the Cure. Why a watrish tumour must be opened with an instrument. A History.

CHAP. XIX.

Of an Atheroma, Steatoma, and Meliceris.

In what an *Atheroma*, *Steatoma*, and *Meliceris* differ.

ALthough these tumours may be thought to be comprehended under one *genus* with the other *Oedematous* tumours, 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 Στεαρ in *Greek* signifieth Tallow or Scam] yet it oft-times is found stuffed with other divers hard bodies, stony, bony, or callous, like unto the claws an Hen. For *Philoxenus* reports that he sometimes saw Flies in a *Steatoma* at the opening thereof, and such other like things wholly dissenting from the common matter of Tumours. 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 tumours appear and rise without any inflammation going before them. Thus you shall know these tumours, a *Steatoma* is harder than the other two, neither yields it to the pressure of your finger; but when it once yields, 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* yields 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 tumour. 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.

Of Chirurgery to be used to these tumours.

As for the manual 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 humour, as also the receptacle in which it is contained. Yet you must note such tumours, sometimes as it were hanging in the surface of the skin, are easily to be moved this way, and that way; but othersome again deeper fastned firmly cohere with the adjacent bodies, and these require an exquisite hand, and also industry, for fear of a great flux of bloud and convulsion by cutting a Vein. There are many other kinds of tumours, as the *Testudo* or Mole, the *Nata*, the *Glandula*, *Nodus*, *Botium*, *Lupia*, which as in matter (for they are all of a thick, clammy, and viscous Phlegmatick humour) 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 tumours, as Stones, Chalk, Sand, Coals, Snails, Straws, or Awns 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 *fossils* in these tumours.

The generation of which things (by the corruption and alteration of humours) shall not make us much to admire it, if we consider, that as Nature, of all Seeds and Elements of the whole great World, hath made Man, the Microcosm 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 tumours 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 tumour contrary to Nature, soft, diffused, 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 tumour, 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 it denomination from an Acorn, called *Glans* in Latine, the which it somewhat resembles in the compass and form of the tumour; or else because it most commonly breeds in the Glandules or Emunctories of Mans body.

What *Nodus*.

The *Nodus*, or knot, is a round tumour, hard and immoveable, named from a rope tied on a knot. *Guido Cauliacensis* affirms Knots commonly to grow into 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 *Ganglion* is.

A Wen or *Ganglion*, is a tumour sometimes hard, sometimes soft, yet always round, using to breed in dry, hard, and nervous parts. And seeing that some of the tumours 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 pass 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*.

Signs.

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

great bigneſs, in the ſpace of ſix or ſeven years, ſome of them yield much to the touch, and almoſt all of them are without pain.

You may hinder ſuch as are beginning and firſt growing from increaſe, 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 humour grows hot, is attenuated, and reſolved. But if ſo you nothing prevail, you muſt lie upon them with your whole hand, or a flatted piece of Wood, as heavy as you can, until 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 Quickſilver; for I have many times found by experience, that it hath a wonderful force to reſolve and waſte the ſubject humour. But if the Wen be in ſuch a place in which you can make no ſtrong impreſſion, as in the Face, Cheſt, Belly, and Throat, let there be applied an Emplaiſter which hath a reſolving force, ſuch as this following hath: ℞ *Gummi ammon. bdellii. galban. an.* ʒ iij. *liquefiant in aceto, & trajiciantur per ſetaceum, addendo olei liliorum & lauri, an.* ʒ i. *aqu. vitæ parum, pulveris ireos, ſalis ammon. ſulphur. vivi, vitrioli Romani, an.* ʒ ß. Let them be 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.

Their Cure at the beginning.

Plates of Lead rubbed with Quickſilver.

A reſolving Plaiſter.

Things to waſte or conſume the bag.

Sometimes Wens grow to ſo great a maſs 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 ſhall require; then draw it many times about between the skin and the bag, even to the root of the Wen, that ſo the skin may be divided long ways, 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 you muſt obſerve, that in a Wen there are always certain Veſſels which are ſmall in the beginning, but much increaſed in proceſs of time, according to the increaſe 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 piece 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 be 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 onely 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 bottom of the ulcer until it be perfectly cleanſed, and the reſt of the Cure be Workman-like performed, even to the cicatrizing thereof.

The Chirurgeon *Collo*, and I, uſing this method, in the preſence of Maſter Dr. *Violanius* the Kings Phyſician, took away a Wen from Martial *Collard* the Maior of *Burbon*, it hanged at his neck, as big as a Mans head, and it weighed eight pounds; which made it ſo troubleſom and burdenſom to him, that he was forced to carry it bound up in a Towel as in a Scrip.

A Hiſtory.

Verily, if theſe kind of Tumors have a ſlender root and broad top, they muſt be ſtraitly tied, and ſo cut off. But it is very difficult and full of dangerous chance, to take away ſuch Wens as are ſeated in the Neck near unto the Jugular Veins, thoſe under the Arm-holes, in the Groins, and ſuch as are under the Ham; by reaſon of the deadly force of ſuch ſymptoms as may thence ariſe. We can onely conjecture, not certainly ſay, what kind of matter may be contained in them. We can onely 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 Pebles.

What Wens to be cured by ligature.

Which dangerous to cure.

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 Peble; it was held, whileſt ſhe lived, both by the Phyſicians and the Chirurgeons, to be a *Cancer*, becauſe this hardneſs was very painful to her when it was but gently preſſed down.

A Hiſtory.

The matter of a Wen is ſometimes taken for a *Cancer*.

But alſo ſome few years agon, I, being called to the Cure of a very honeſt Woman, which was troubled with the ſame diſeaſe, ſtrongly withſtood the Phyſicians 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 uſual time, and was well-liking, and had a good colour in her face and body, was free from all ſort of pain, unleſs when you preſſed down the part affected. Beſides, thenceforward the Tumor grew not at all, no other evil accident befel her, yea verily ſhe lives merrily, and well both in body and mind.

Another Hiſtory.

How you may know a Wen from a *Cancer*.

CHAP. XXI.

Of a Ganglion *more particularly ſo called.*

THere are alſo certain ſmall Tumors of the kind of *Dupiæ*, 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

What a *Ganglion* properly ſo called is.

The cauſes.

flowed to these parts, seeing it can neither be concocted, nor assimilated into the proper substance, is converted into an humour 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.

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 onely apply *Ammoniacum* and *Galbanum* dissolved in Vinegar and *Aqua Vitæ:* as, ℞ *Gummi ammon. & sagapeni in aqua vitæ dissolutorum, an.* ℥ i. *coquantur super cineres calidos ad formam emplastri, sub finem adde sulphuris vivi subtiliter pulverisati* ℥ β. *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, until the bladder or bag be broken under your finger, which I have divers times done; then it will be expedient presently to apply and bind hard thereunto a plate of Lead rubbed with Quicksilver, which may waste 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 Evil.*

What the *Scrophulæ* or Kings Evil is.

THe *Scrophulæ* are œdematous tumors arising in the glandulous parts, as the Brests, Arm-holes 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, a bag, as *Atheromates*, *Steatomates*, and *Melicerides* are.

Their material cause. How they differ from other glandulous tumors.

They are made of a gross, cold, viscid, and phlegmatick matter with some admixture of Melancholy. They differ from other glandulous tumors, not in number, for most usually there appear many of them united together, springing from somewhat a deeper root than glandulous tumors do; some of them are moveable, othersome woven with the neighbouring nerves, remaining unremoveable.

Ganglia appear fewer in number, and are without pain; but *Scrophulæ* often-times are painful, especially when they wax hot by putrefaction; so that sometimes they degenerate into cancerous Ulcers, not to be touched by Instruments nor acrid Medicins.

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 sedentary 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, wastes it.

Emollient and resolving Medicins.

And they are cured by purging off the superfluous humours, and also by application of emollient resolving and suppurating Topick Medicins, after this following manner. ℞ *Mucaginis alth. fænugr. & ficum ping. an.* ℥ ij. *olei liliorum, & chamem. an.* ℥ i. *pinguedinis anseris & axungiæ porci* ℥ i. *Terebinth. Ven.* ℥ i. *ammoniaci, & galbani in aceto dissolutorum, an.* ℥ i. *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 until the Patient come to Salivation, for so nature will disburden it self of the humour generating the *Scrophulæ*, which I have sometimes tried with happy success. ℞ *Emplastri diachyl. alb. & mag. ceroti æsopi descriptionis Philagrii, an.* ℥ ij. *Terebinth. clarę* ℥ i. *olei liliorum parum, fiat emplastrum satis molle.* But if the *Scrophulæ* cannot by this means be resolved,

Suppuratives.

but, as it oft-times happens, tend to suppuration, you must use Suppuratives, as ℞ *Rad. alth. & lilior. an.* ℥ iij. *coquantur in aqua communi, pistentur, trajectis adde capitum aliorum sub cineribus coctorum* ℥ iij. *olei liliorum, & ping. anseris & anatis, an.* ℥ i. β. *farinæ seminis lini quantum satis; formetur cataplasma.*

A Note to be observed in opening *Scrophulous* tumors.

Here we must admonish the Chirurgeon that he open not the *Scrophulæ*, before that all the contained humour be fully and perfectly turned into *pus*, or matter, otherwise the residue of the humour will remain crude, and will scarce 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.

Natural heat the cause of suppuration.

For we must not, as soon as any portion of the contained humours appear converted into *pus*, procure and hasten the apertion. For that portion of the suppurated humour 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 putrifying 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 humour, will cause the remaining portion of the humour not to suppurate, or that very hardly, and with much difficulty. Yet if the tumefied 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.

The Chirurgical 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 those parts with which they were intangled. But in the performance of this work, we take especial care that we do not violate or hurt with our instrument the Jugular Veins, the sleepy Arteries, or recurrent Nerves. If at any time there be danger 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 by binding the thred strait on both sides, that so bound they may fall off by themselves by little without any danger. The remainder of the Cure may be performed according to the common rules of Art.

CHAP.

CHAP. XXIII.

Of the Fever which happens upon an œdematous Tumour.

HAving shewed all the differences of œdematous Tumors, it remains, that we briefly treat of the Symptomatical Fever, which is sometimes seen to happen upon them. This therefore retaining the motion of the humour by which it is made, is commonly of that 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. How an intermitting Quotidian happens upon œdematous tumors.

The primitive causes of this Fever, are the coldness 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 cause of a Quotidian Fever.

The antecedent causes are, a great repletion of humors, and these especially phlegmatick. The conjunct cause is Phlegm putrefying in the habit of the body, and first region thereof without the great Veins.

The signs of this Fever are drawn from three things; as first Natural, for this Fever or Ague chiefly seizes upon those which are of a cold and moist temper, as Old Men, Women, Children, Eunuchs, 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 bloud, and the substance of the parts. But it takes children by accident, not of it self, and their own nature, for Children are hot and moist; but by reason of their voracity or greediness, and their violent, inordinate, and continual motion after their plentiful feeding, they heap up a great quantity of crude humours, fit matter for this Fever, whereby it comes to pass, that fat children are chiefly troubled with this kind of Fever, 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 vapours, by which the heart being molested, is easily taken by this kind of Fever. The Signs. How children come to be subject to Quotidian Fevers.

From things not Natural, the signs of this Fever 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 onely cold and moist, but also hot and dry, if they be devoured in such plenty, that they overwhelm the native heat.

For thus Wine, although it be by faculty and Nature hot and dry, yet taken too immoderately, it accumulates phlegmatick humours, and causes cold Diseases. Therefore Drunkenness, Gluttony, Crudity, Baths, and Exercises presently after meat, being they draw the meat as yet crude into the Body and Veins; and to conclude, all things causing much phlegm in us, may beget a Quotidian Fever. But by things contrary to Nature, because this Fever usually follows cold Diseases, the Center, Circumference and Habit of the Body being refrigerated. How phlegmatick humors happen to be generated by hot and dry meats.

The symptoms of this Fever are, the pain of the mouth of the Stomach, 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 without any thirst, often-times in the fit it self; because the Stomach flowing with phlegm, the watery and thinner portion thereof continually flows up into the mouth and tongue, by the continuity of the inner coat of the ventricle common to the gullet and mouth. The Symptoms of Quotidians.

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 Fever 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 smoky at the first; but at length when the moisture, being overcome, doth no more hinder its action, it burns and flames freely. The manner of the pulse and heat in a Quotidian.

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 determinated in a plentiful sweat, it shews the Fever will not long last; for it argues the strength of Nature, the yielding and tenuity of the matter flying up, and the excretion of the conjunct cause of the Fever. Critical Sweats. The Urin.

A Quotidian Fever 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 Quartan Fever, especially if it be bred of salt Phlegm, 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 Fever, 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 pass, that this Fever oft-times lasts sixty days. 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 distinguith these Fevers by the kind of the humour, and the propriety of the symptoms and accidents; besides, Quotidian 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 humours 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 plentiful sweat breaking forth, the matter being concocted, causes us to think the Quotidian short and salutary. Why Quotidians are oft-times long. Into what Diseases a Quartan usually changes. 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 breathe in a clear air moderately hot and dry; let his meats be bread Diet.

bread well baked, Cock or Chicken broths, in which have been boiled the roots of Parſley, Sorrel and the like.

When the uſe of ſpiced and ſalted meats are fit.

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, fried or boiled, rear Eggs, and ſuch like. Theſe Fruits are alſo good for him, Raiſins, 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 feverish heat inwardly in the Bowels.

When Sleep is hurtful.

For the Paſſions of the Mind, the Patient muſt be merry, and comforted with a hope ſhortly to recover his health. It ſeems not amiſs to ſome, at the coming of the Fit to put the feet and legs into hot Water, in which Chamomil, Dill, Melilot, Marjerom, Sage, and Roſemary have been boiled.

Medicins.

The Medicins 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 Chamomil, Calamint, Melilot, Dill and the like, or with common decoctions. The Purgatives ſhall be *Diaphœnicon*, *Electuarium*, *Diacarthami*, *Hierapicra*, Agarick, Turbith, of which you ſhall make Potions with the Waters of Mints, Balm, Hyſſop, Sage, Fennel, Endive, or the like; *Pilulæ 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.

Care muſt be had of the Stomach. Vomits.

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 Chamomil 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 Chamomil; and Syrup of Vinegar will be very good, eſpecially at the beginning of the Fit, when Nature and the humours 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*.

The uſe of Treacle in an inveterate Quotidian.

CHAP. XXIV.

Of a Scirrhus, *or an hard Tumor proceeding of Melancholy.*

What a true and legitimate *Scirrhus* is. What an illegitimate *Scirrhus* is.

HAving ſhewed the nature of Tumors cauſed by Bloud, Choler, and Phlegm, it remains we ſpeak of theſe, which are bred of a Melancholick humour: 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 natural melancholick humour. The ſecond is, of an illegitimate *Scirrhus*, that is of an hard Tumor inſenſible, and without pain, of a melancholick humour concrete by too much reſolving and refrigerating. The third is of a cancrous *Scirrhus* bred by the corruption and aduſtion of the melancholick humour. 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 groſs, tough, and tenacious humor concrete in any part. But the generation of ſuch a humor in the body happens either of an ill and irregular diet, or of the unnatural affects 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 humour. The illegitimate, or baſtard *Scirrhus* which is wholly without pain and ſenſe, and alſo the cancerous, admit no cure; and the true legitimate ſcarce yield to any.

Prognoſtick.

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 Phyſician ſhall preſcribe a convenient Diet, that is, ſober and moderate 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, *Epithymum*, according to the mind of the learned Phyſician. The third conſiſts in the convenient uſe of Topick Medicins, that is, emollient at the beginning, and then preſently reſolving, or rather ſuch as are mixed both of reſolving and emollient faculties, as *Galen* teaches; for by the uſe of onely emollient things there is danger of putrefaction, and a *Cancer*; and onely of reſolving there is fear of concretion, the ſubtiler part being reſolved, and the groſſer ſubſiding.

Lib. 2. ad Glauconem.

Emollients.

The emollient ſhall be thus: ℞ *Rad. althæ. lib. ſ. rad. liliorum* ℥ iij. *coquantur in aqua com. poſtentur, trajiciantur per ſetaceum, addendo olei chamem. & lilior. an.* ℥ ij. *axipi humid.* ℥ ß. *emplaſtri diachyl. alb. cum oleo liliorum diſſoluti* ℥ iij. *cereæ albæ quantum ſit ſatis, fiat cerotum.* Or, ℞ *Gummi ammoniaci, galb. bdellii, ſtyracis liquidæ in aceto diſſolutorum, an.* ℥ i. *diachyl. mag.* ℥ i. ß. *olei liliorum, & axungiæ anſeris.*

anſerie, an. ℥ i. *cerati æſip. deſcriptione Philagr.* ℥ ij. *liquefcant omnia ſimul, ceræ quantum ſit ſatis, ut inde fiat cerotum ſatis molle.* When you have ſufficiently uſed emollient things, fume the tumour with ſtrong Vinegar and *Aqua Vitæ* poured upon a piece of a Milſtone, Flint, or Brick, heated very hot; for ſo the mollified humour will be rarified, attenuated, and reſolved; then ſome while after renew your emollients, and then again apply your reſolvers to waſte that which remains, which could not be performed together, and at once; for thus *Galen* healed a Scirrhus in *Cireillus* his Son. Goats dung is very good to diſcuſs Scirrhous tumours; but the Emplaiſter of *Vigo* with a double of *Mercury* is effectual above the reſt, as that which mollifies, reſolves, and waſtes, all tumours of this kind.

Lib. ad Glauc.

The efficacy of the Empl. of Vigo with Mercury.

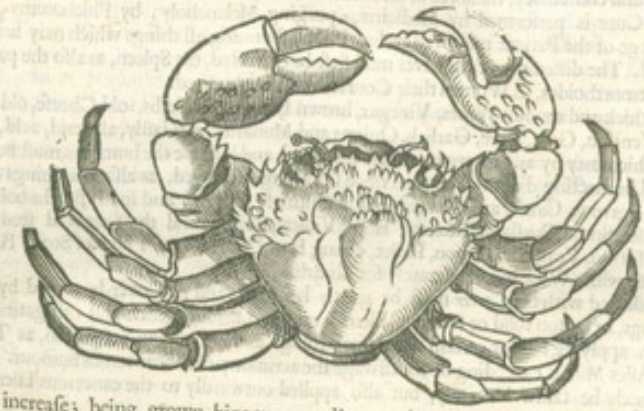
CHAP. XXVI.

Of a Cancer *already generated.*

A *Cancer* is an hard tumour rough and unequal, round, immoveable, of an aſh or livid colour, horrid by reaſon of the Veins on every ſide, ſwollen with black bloud, and ſpread abroad to the ſimilitude of the ſtretched-out legs and claws of a Crab. It is a tumour hard to be known at the firſt, as that which ſcarce equals the bigneſs of a Chick, or *Cicer*: after a little time it will come to the greatneſs of a Haſel-nut, unleſs peradventure provoked by ſomewhat too acrid Medicins

What a Cancer is.

The Figure of the Crab, *called* Cancer *in Latine.*



it ſuddenly increaſe; being grown bigger, according to the meaſure of the increaſe, it torments the Patient with pricking pain, with acrid heat, the groſs bloud reſiding in the Veins growing hot, and inferring a ſenſe like the pricking of Needles, from which notwithſtanding the Patient hath oft-times ſome reſt. But becauſe this kind of tumour by the Veins extended and ſpread about it like claws and feet, being of a livid and aſh-colour, aſſociated with a roughneſs of the skin and tenacity of the humour, repreſents, as it were, the toothed claws of the Crab, therefore I thought it not amiſs to inſert (as before) the Figure of the Crab, that ſo the reaſon both of the name and thing might be more perſpicuous.

The nature of the pain.

The reaſon of the name.

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 groſs and feculent bloud; by the morbifick affection of the Liver diſpoſed to the generation of that bloud, by the infirmity or weakneſs of the Spleen in attracting and purging the bloud, by the ſuppreſſion of the Courſes, or Hæmorrhoids, or any ſuch accuſtomed evacuation. The conjunct cauſe is that groſs and melancholick humour ſticking and ſhut in the affected part, as in a ſtrait. That melancholick bloud which is more mild and leſs malign, onely 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 humour which generateth 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 bloud, by perturbations of the mind, anger, heat, and Medicins 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 internal parts, as the Guts, Womb, Fundament; others the external, 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 ſtaid, until it hath eaten even to the innermoſt of the part which it poſſeſſes. It invades Women

The ſorts and differences of Cancers.

Aetius lib. 6.

The parts moſt ſubject to Cancers.

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 humour, such are the Breasts, and all the emunctories of the noble parts. When it possesses the Breast it often causes inflammation to the Arm-holes, 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 blades. 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 Medins, as potential Cauteries; but we must onely seek to keep them from growing more violent, and from spreading further, by gentle Medicins, 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.

What *Cancers* one must not undertake truly to cure.

CHAP. XXVIII.

Of the Cure of a Cancer *beginning, and not yet ulcerated.*

Lib. 2. ad Glauc. A *Cancer* beginning, is oft hindered from increasing, before it fasten its roots; but when it hath once increased, it admits no cure but by iron, as that which contemns, by reason of the malignity and contumacy, the force of all Medicins. *Galen* affirms he cured a *Cancer* not ulcerated. Now that Cure is performed by Medicins, purging Melancholy; by Phlebotomy, when the strength and age of the Patient may well endure it; by shunning all things which may breed ill and feculent blood. The distemper of the Liver must first be corrected, the Spleen, as also the part affected; in Men the Hæmorrhoides, 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 humours, 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, Sorrel, 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 Eggs; 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 over-burdened by over-hard or heavy things, or by too solid or fat Emplaisters; on the contrary, gentle and mitigating Medicins must be used; applying also at certain times such things as resist venom, or poison, as Treacle and Mithridate. Asses Milk is exceeding fit to assuage the acrimony of the cancerous humour. Therefore it must not onely be taken inwardly, but also applied 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 roundness of the tumour, the inequality, roughness, and pain; to the judgment of the eye the tumour seems soft, but it is hard to the touch; the Ulcer is filthy, with lips, thick, swollen, 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 blood. 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, fever, 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 dissuading, 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 blood must not be presently stopped, but permitted to flow out in some measure, yea verily pressed forth all about it, that so the Veins swollen with black and melancholy blood may be disburdened. When you have taken a sufficient quantity of blood, the place must be seared with an actual cautery. For that will strengthen the part affected, draw forth the venenate quality, and also stay the defluxion. Then must you apply mitigating Medicins, 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 Pomegranate, the pricking pain, and all the symptoms being assuaged. Yet the cure of an ulcerated *Cancer* which shall possess the lips, may be more happily and mildly performed, no caustick Medicin being applied 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 Counsel, *James Guillemeau*, and Master *Eustachius* the King's Chi-

How and 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.

Chirurgeons, and *John le Feure* the Duke of *Guise* his most worthy Chirurgeon being present.

A new and observable way of taking away a *Cancer* from the lip.

The way is this; The *Cancer* must be thrust through the lips on both sides, above and 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 (left 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.

CHAP. XXX.

Of the Topick Medicines to be applied to an ulcerated and not ulcerated Cancer.

Repelling Medicins.

WE at the beginning use repercussive Medicins, such as are the juices of Nightshade, Plantain, Henbane, Lettuce, Sorrel, Housleek, Water, Lentil, or Ducks-meat, Knot-grass, Pomegranates, and the like. Also *oleum rosarum Omphacinum*, the powders of Sumach, Berberies, Litharge, Ceruse, Burnt-lead, *Tutia*, Quick-silver, and the like. Of which you may compose Fomentations, Liniments, Ointments, Cataplasms, Emplasters. *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 Medicin is very commendable.

℞ *Litharg. & cerus. an.* ʒ i. *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 pompholygis thuris an.* ʒ ij. ℈ *absinth. pontic.* ʒ ℈. *olei rosarum* ℥ iij. *cerae* ʒ vj. *succi solani, quantum sufficit ad unguenti crassitudinem.* They very much commend *Theodoricks* Emplaister to assuage the pain of ulcerated *Cancers*.

Theodoricks Emplaisters.

℞ *Olei ros. cerae alb. an.* ʒ ij. ℈. *succi granat. & solanii, an* ʒ ij. *cerussae lotae* ʒ i. *plumbi usti, loti, & tuthiae praepar. an.* ʒ ℈. *thuris mastich. an.* ʒ ij. *fiat empl. mollc.* This following Ointment I have often used with good success.

℞ *Theriac. veter.* ʒ i. *succi cancrorum* ℥ ß. *succi lactucae & olei rosar. an.* ʒ i. ℈. *vitel. ovorum sub cinerib. cott.* ij. *camphor.* ʒ ß. *pistentur omnia in mortario plumb. & fiat unguentum.*

℞ *Spum. argent. axungiae porci recentis cerae alb. an.* lb ℈. *olei boni* ℥ viij. *vitel. ovorum assat.* iv. *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 ulcerated *Cancer*, in that part where the torment was most vehement, by disburdening the part of some portion of the malign humour; which same thing I have done by application of young Whelps, or Pigeons, or Chickens, cut long-ways, and prudently applied to the ulcer, and now and then changed as soon as their heat seems dissolved; and others applied for their natural heat in an Anodyne or mitigating Medicin. *John Baptista Theodosius* in his Epistles writes, that a cataplasm 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 injection and lotions cleanses the ulcer and mitigates the pain. If the *Cancer* affect the Womb, the Patient feels the pricking of the pain in the groin above the *pecten*, and in the Kidneys, and is often troubled with a difficulty of making water; but when it is ulcerated, it pours forth filth, or matter, exceeding stinking and carion-like, and that in great plenty, the filthy vapour of which carried up to the heart, and brain, causes often swounding. Now to mitigate the pains of such like places, the following Medicins 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, fænugr. extract. in aqua rosar. & plantaginis quod satis est.* Of this being warm make a Fomentation.

℞ *Rad. Altheae* lb ß. *coquantur in hydromelite, pistentur & trajiciantur, addendo ol. rosar. parum, fiat Cataplasma.* Also you shall make divers pessaries according to the different kind of pain; also make injections of the juice of Plantain, Knot-grass, Lettuce, Purslain, mixed together, and agitated or laboured in a Leaden Mortar with a little Oil of Roses; for this kind of Medicin is commended by *Galen* in every kind of ulcerated *Cancers*. Also this following Water is very profitable, and often proved by me. ℞ *Stercoris bubuli* lb iv. *herbae Roberti plantag. sempervivi, hyoscyami, portulac. lactuc. endiv. an. m.* i. *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 applied and renewed ever and anon; for so the acrimony and force of the inflammation is retunded, and the pain assuaged. *Galen* beats into powder River Crabs burnt; the powder mixed with Ointment of Roses is most profitably applied upon lint to cancerous Ulcers.

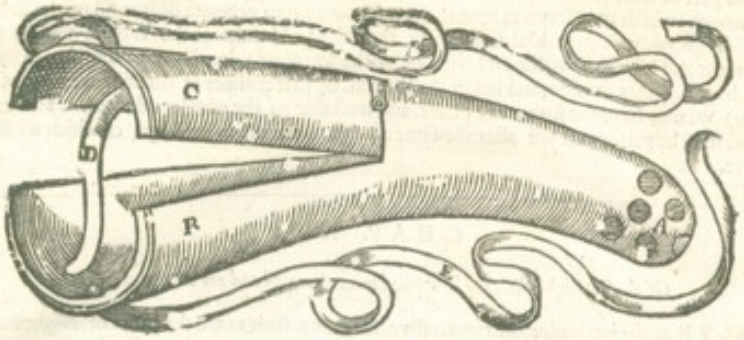
Lib. 9. Simpl.

Lib. 4. de comp. med. secundum gen.

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 Vapours may more easily breathe 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,

open, more or leſs, according to the Phyſicians mind; let there be two ſtrings or laces put unto it, by which being tied 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 ſtring, which is marked with the letter* D.
E E *The ſtrings or laces.*

Lib. 6. ſimp. Plates of Lead A Hiſtory.

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 Medicin 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 Medicins, are, as it were, Antidotes to waſte and overcome their malignity and evil nature. This kind of remedy, when it was preſcribed by that moſt excellent Phyſician *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 Walnut, did not truly throughly heal it, yet notwithſtanding kept it from further growth. Wherefore at length growing wearyot it, when ſhe had committed her ſelf to a certain Phyſician, boldly promiſing her quick help, ſhe tried, with loſs 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 Medicin, and had begun the cure with mollifying, heating and attractive things, the pain, inflammation, and all the other ſymptoms increaſing, the tumor grew to that bigneſs, that being the humour 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 Pomgranate cleaves when it comes to its full maturity; whereupon an immoderate flux of bloud followed, for ſtaying whereof he was forced 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, yielded up her Ghoſt in the Phyſicians boſom.

CHAP. XXXI.

Of the Fever which happeneth in Scirrhous Tumors.

Why a Quartan happens upon Scirrhous tumors.

SUch a Fever is a Quartan, or certainly coming near unto the nature of a Quartan, by reaſon of the nature of the Melancholick humour of which it is bred. For this ſhut up in a certain ſeat in which it makes the tumour, by communication of putrid vapours heats the heart above meaſure, and enflames the humours contained therein, whence ariſes a Fever. Now therefore a Quartan is a Fever coming every fourth day, and having two days intermiſſion.

The primitive cauſes thereof are theſe things which increaſe Melancholick humours 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, Cabbadge, thick and muddy Wines, and other ſuch things of the ſame kind.

The antecedent cauſes are, heaped up plenty of Melancholick humours, abounding over all the body. But the conjunct cauſes are Melancholick humours putrefying without the greater Veſſels, in the ſmall Veins, and habit of the body.

The ſigns.

We may gather the ſigns of a Quartan Fever from things which they call natural, not natural, and againſt nature. From things natural; 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 Quartan Fevers.

Why they are frequent in Autumn.

Of things not natural; this Fever or Ague is frequent in Autumn, not onely becauſe, for that it is cold and dry, it is fit to heap up Melancholick humours; but chiefly by reaſon that the humours by the heat of the preceding Summer are eaſily converted into aduſt Melancholy, whence far worſer and more dangerous Quartans ariſe, than of the ſimple Melancholick humour: to conclude, through any cold or dry ſeaſon in a region cold and dry, men that have the like Temper

eaſily

eaſily fall into Quartains; if to theſe a painful kind of life full of danger and ſorrow doth accrew.

Of things contrary to Nature, becauſe the fits take one with painful 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 skurf and puſtules, eſpecially on the legs; the pulſe at the beginning is little, ſlow, and deep, and the urin alſo is then white and waterish, inclining to ſomewhat a dark colour.

In the declination when the matter is concocted, the urin becomes black, not occaſioned by any malign ſymptom or pretematural exceſs of heat (for ſo it ſhould be deadly) but by excretion of the conjunct matter. The fit of the Quartain continues twenty four hours, and the intermiſſion is forty four hours. It often takes its original from an obſtruction, pain and *Scirrhus* of the Spleen, and of the ſuppreſſing 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 Phyſician in his Diet, infer no greater harm, but free him from more grievous and long diſeaſes, as Melancholy, the Falling-ſickneſs, Convulſion, 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 errour 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 aduſt melancholy humor; becauſe the melancholy humor, terreſtrial of its own nature, and harder to be diſcuſſed than any other humor, is again made by aduſtion (the ſubtiler 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 contrary to the cauſe of the Feaver in the uſe of the ſix things not natural, as much as lies 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 urin and ſweat; yea verily at the beginning of the fit, a draught of ſuch Wine will cauſe vomitting, 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 than 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, and eaſie evacuation of the Phlegmatick and Cholerick humor, and leſs troubleſome to Nature: And of all the crudities with which the mouth of the ventricle abounds in a Quartain, by reaſon of the more copious afflux of the Melancholick humor, which by his qualities cold and dry diſturbs all the actions and natural faculties. Moreover, exerciſes and frictions are good before meat; ſuch paſſions of the mind are as contrary to the cauſe from which this Feaver takes his original, 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 deale withal, and we muſt abſtain from all very ſtrong medicines, until ſuch time as the diſeaſe hath been of ſome continuance. For this humour, contumacious at the beginning, when as yet Nature hath attempted nothing, is again made more ſtubborn, terreſtrial 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 Baſilick-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 and 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 Maiden-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 Treacle 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 general declination of the diſeaſe after general purgations, the humor and body being prepared, and the powers ſtrong: And certainly an inveterate Quartain can ſcarce ever be 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 aſſoon as they came forth of their beds, 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 boiled in an Apple of *Coliquintida*, the Kernels taken out, upon hot coals, to the conſumption of the half part, mixing therewith ſome little quantity of the Powders of Pepper, Pellitory 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. Therefore, if on the contrary, The Quartain Feaver ſhall be cauſed by aduſt choler, we muſt hope for and expect a cure by refrigerating and humective medicines, ſuch as Sorrel, Lettuce, Purſlane, broths of the decoctions of Cucumbers, 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

How much vomiting prevails to cure a Quartain.

Medicines.

What Quartains muſt be cured with refrigerating things.

theſe

these kinds of Quartain Feaver by the only use of refrigerating *Epithemata* 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 Medicins 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 yielding to the touch, made by the blood and spirit poured 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 veinous vessel by the name of an *Aneurisma*. *Galen* calls an *Aneurisma*, an opening made of the *Anastomosis* 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 seldom happen in opening of Arteries unskilfully performed and negligently cured; therefore *Aneurisma's* are absolutely made by the *Anastomosis*, 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 painful travail. For when as they more strongly strive to hold their breath, for the more powerful 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 not varying from the native constitution of the skin. It is a soft tumor, and so yielding to the impression 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 *Aneurisma's* 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 vital spirit rushing with great violence through the straitness of the passage.

In what parts they chiefly happen.

Prognostick.

Wherefore in *Aneurisma's* in which there is a great rupture of the artery, such a noise is not heard, because the spirit is carried through a larger passage. Great *Aneurisma's* under the arm-pits, in the groins and other parts 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.

A History.

Which I observed a few years ago in a certain Priest of St. *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 juice of Night-shade and Houseleek, with new and wheyey cheese mixt therewith: Or with *Unguentum de Bolo*, or *Emplastrum contra rupturam*, 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 instead of a swathe, and 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 year, 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 aid, and bids that I should be called to stay this his great bleeding, and he repented that he had not followed my direction. Wherefore I was called, but when I was scarce over the threshold, he gave up his ghost with his blood. Wherefore I diligently admonish the Chirurgeon that he do not rashly open *Aneurisma's*, unless they be small, in an ignoble part, and not indued with large vessels, but rather let him perform the cure after this manner: Cut the skin which lies over it until 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 thread of it self, whiles Nature covers the Orifices of the cut artery with the new flesh, then the residue of the cure may be performed after the manner of simple wounds. The *Aneurisma's* which happen in the internal 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 being so attenuated and heated therewith, that it cannot be contained in the receptacles of the artery, it distends it to that largeness 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 poured forth into the capacity of the chest, but the body of the artery was dilated to that largeness 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 Physicians School, whilst I publickly dissected a body there; whilst he lived, he said he felt a beating and a great heat over all his body the force of the pulsation of all the Arteries, by the occasion whereof he often swounded. Dr. *Sylvius* the Kings Professor of Physick at that time forbad him the use of Wine, and wished him to use boiled water for his drink,

Aneurisma's must not rashly be opened.

How they must be cured.

Those of the inward parts incureable.

A History.

and

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 Priſan of Barley 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 *Aneuriſmates* 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 dried and hardned, it degenerates into a griſtly or elſe a bony ſubſtance, juſt by the force of the ſame material and efficient cauſes, by which ſtones are generated in the reins and bladder. For the more terreſtrial portion of the blood is dried and condenſed by the power of the unnatural 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 Hand-maid 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 vital ſpirits; unleſs any had rather to refer the cauſe of that hardneſs to the continual application of refrigerating and aſtringent 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 fore-mentioned ſigns; for ſometimes in large *Aneuriſmates* 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 antient 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 Gangrene, and mortification of the part, and laſtly, the death of the creature.

Lib. 4. cap. ult. de præſ. ex pulſu.

A Caution in the knowing *Aneuriſmates.*

The end of the Seventh Book.

BOOK VIII.

Of particular Tumors againſt Nature.

The PREFACE.

BEcauſe the cure of Diſeaſes muſt be varied according to the variety of the temper, not only of the body in general, 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 general, 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.*

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 external 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 abundance of ſerous and acrid blood, which by its tenuity and heat ſweats through the pores of the veſſels, ſomtimes between the muſculous skin of the head, and the *Pericranium*; ſometimes between the *Pericranium* and the skull; and ſometimes between the skull and membrane called *Dura mater*, and otherwhiles in the ventricles of the brain.

What it is. The cauſes. Differences by reaſon of place.

The ſigns of it, contained in the ſpace between the muſculous skin and the *Pericranium*, are a manifeſt tumor without pain, ſoft, and much yielding to the preſſure of the fingers. The ſigns when it remaineth between the *Pericranium* and the skull, are for the moſt part like the fore-named, unleſs it be that the Tumor is a little harder, and not ſo yielding 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 of the whole ſubſtance thereof, there is a dulneſs of the ſenſes, as of the ſight and hearing; the tumor doth not yield to the touch, unleſs you uſe ſtrong impreſſion, for then it ſinketh ſomewhat down, eſpecially in Infants newly born; who have their skulls almoſt as ſoft as wax, and the junctures of their ſutures lax, 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 fore-head stands somewhat further out, the eye is fixt and immoveable, and also weeps by reason of the serous humor sweating out of the brain.

A History. *Vesalius* writes, that he saw a Girl of two years 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.

Abucrasis tells, 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 external Tumor.

Therefore whether the humor lye under the *Pericranium*, or under the musculous skin of the head, it must first be assailed with resolving medicines, but if it cannot be thus overcome, you must make an Incision, taking heed of the Temporal 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 reason of the name. 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 consistence. This tumor stops the nose, intercepting and hindring the liberty of speaking and blowing the nose. *Lib. 6. cap. 8.* *Celsus* saith, the *Polypus* is a caruncle or 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 be seen behind the *Uvula*, and often strangles a man by stopping his breath. The differences hereof. There are five kinds thereof; the first is, a soft membrane, long and thin like the relaxed and depressed *Uvula*, 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 a hard tumor, like flesh, which when it is touched, yields a sound like a stone; it is generated of melancholy blood dried, being somewhat of the nature of a *Scirrhus* confirmed, and without pain. The fifth is, as it were, compoled of many cancrous Ulcers spread over the transverse surface of the gristle.

Which of them admit no manual operation. Of all these sorts of *Polypi* some are not ulcerated, others ulcerated, which send forth a stinking and strong smelling filth. Such of them as are painful, hard, resisting, and which have a livid, or leaden colour, must not be touched with the hand, because they savour of the nature of a *Cancer*, as into which they often 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.

An Anodyne. R. *Olei de vitell. ovorum* ʒ ij, *Litharg. auri, & Tutiæ præp. an.* ʒ i, *succi plat. solani an.* ʒ i ß, *Lapid. hæmatit. & camphoræ, an.* ʒ ß. Let them be wrought a long time in a leaden Mortar, and so make a medicine to be put into the nostrils. Those which are soft, loose, and without pain, are sometimes curable, being plucked away with an Instrument made for that purpose, or else wasted by actual cauteries put in through a pipe, so that they touch not the found part; or by potential cauteries, as *Egyptiacum* compoled of equal parts of all the simples with Vitriol, which hath a faculty to waste such like flesh. Why it must be taken clear away. *Aqua fortis* and Oyl of Vitriol have the same faculty, for these take away a *Polypus* by the root; for if any part there remain, it will breed again. But cauteries and acrid medicines must be put into the nostrils with this caution, that in the mean time cold repelling and astringent medicines be applied to the nose and parts about it to asswage the pain, and hinder the inflammation. Such as are *Unguentum de bello*, and *Unguentum nutritum*, white of Eggs beaten with Rose-leaves, and many other things of the like nature.

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. The differences. Of these some are critical, the matter of the disease somewhat digested being sent thither by the force of Nature. Their signs and symptoms. Others Symptomatical, the excrements of the brain increased in quantity, or quality, rushing thither of their own accord. Such abscesses often have great inflammations 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 the most exquisite sense, as also by reason of a nerve of the fifth Conjugation spread over these parts; as also of the neighbouring membranes of the brain, by which means the Patient is troubled with head-ach, and all his

his face becomes swoln. Yet many times this kind of Tumor useth to be raised by a tough, viscous, and gross humor.

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*. Prognostick.

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 abundance of blood, Phlebotomy will be profitable, yea very necessary. But here we must not use the like judgment, in application of local medicines, as we do in other tumors, as *Galen* admoniseth us; that is, we must not use repercussives at the beginning, especially, if the abscess be critical; for so we should infringe or fore-slow the endeavours of Nature forcibly freeing it self from the morbifique matter. But we must much less repel, or drive it back, if the matter which hath flowed thither be venenate, for so the reflow thereof to the noble parts would prove mortal. 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 applied. The cure. *Lib. 3. de comp. med. sec. Locos. Hip. aph. 21. lib. 1.*

℞ *Far. hord. & fenugr. ana* ℥ ij, *coquantur cum mulso aut decocto cham. addendo but. recen. & olei cham.* Gentle resolving medicines. *ana* ℥ i, *fiat cataplasma.* And the following Oyntment will also be good.

℞ *But. recen.* ℥ ii, *olei cham. & lilior. an.* ℥ i, *unguen. de Althea* ℥ ß, *cerae parum:* Make an Oyntment to be applied with moist and greasie wool, to mitigate the pain; also somewhat more strong discussing and resolving medicines will be profitable; as,

℞ *Rad. Altheae & bryon. an.* ℥ ij, *fol. rutae, puleg. orig. an. m.* i, *flo. cham.cm. melil. an. p.* i, *coquantur in hydromelite, pistentur, trajiciantur, addendo farin. fenugr. orobi. an.* ℥ i, *pul. Iridis, 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* and *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 *Scirrus*; but if it tend to suppuration, you shall apply the following medicine. Stronger resolvers.

℞ *Rad. liliorum & ceparum sub cinueribus cost. an.* ℥ iij. *Vitel. ovor. num.* ii, *axung. suillae & unguent. basilicon, an.* ℥ i, *fari. fem. lini* ℥ i ß, *fiat cataplasma.* But if the matter do so require, let the tumor be opened as we have formerly prescribed. A ripening medicine.

CHAP. IV.

Of the Epulis, *or over-growing 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 increased to the bigness of an Egg, so that it both hinders the speech and eating; it casts forth salvious and stinking filth, and not seldom 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 pluck'd away; and let this be the manner thereof. What it is. The Symptomes.

Let it be tied with a double thred, which must be straiter twiched until 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 found parts adjoyning thereto be not hurt; for if so be that it be not burnt, it usually returns. The Chirurgical 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 suddenly, 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 fastned, were become rotten. I have often observed such like flesh by continuance of time to have turned into a grisly 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 success of time is hardened, and makes the taking away thereof more difficult. Why the cure must not be deferred.

CHAP. V.

Of the Ranula.

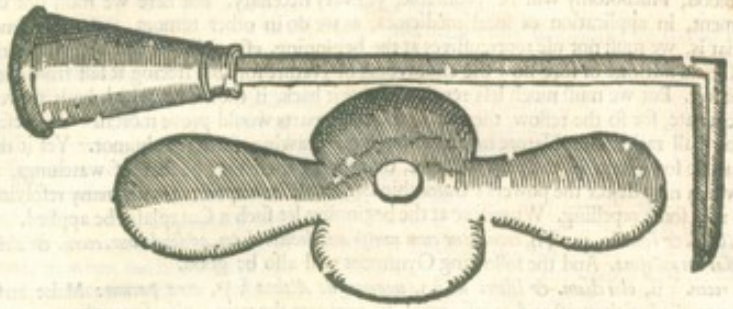
THere is oft-times a tumor under the tongue, which takes away the liberty of pronuntiation or speech; wherefore the Greeks call it *Batrachium*, the Latins *Ranula*, because such as have this disease of the tongue, seem to express their minds by croaking rather than by speaking. The Reason why it is so called.

It is caused by the falling down of a cold, moist, gross, tough, viscid, phlegmatick matter, from the brain upon the tongue, which matter in colour and consistence resembles the white of an Egg, 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 will return again. The manner of opening 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 The Cure.

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, Honey, and Sugar of Roses; for so the Ulcer will be safely and quickly healed.

The Delineation of the Iron-plate, and crooked actual 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 always have moisture, as it were, laid up in store, lest by continual speaking, it should grow dry and fail. For thus this spittle being consumed by feaverish heats, the Patients are scarce able to speak, unless they first moisten their tongue by much washing 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 seldom occasioned by drinking much, and that vaporous Wine; by too much Gluttony, and staying abroad in the open air.

Symtomes.

Swallowing is painful 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 Gagarisms. 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 may 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 ties together the gristly rings, being only cut; you shall then judge 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, until the danger of suffocation be past; and then it must be sowed up not touching the griste: 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 easie 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 that 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 Uvula *or* Columella.

What the *Uvula* is, and what the use thereof.

THe *Uvula* 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 carried to the lungs; and to be as a quill to form and tune the voice. It often grows above measure by receiving moisture falling down from the brain, becoming sharp by little and little from a broader and more swoln *Basis*. Which thing causes

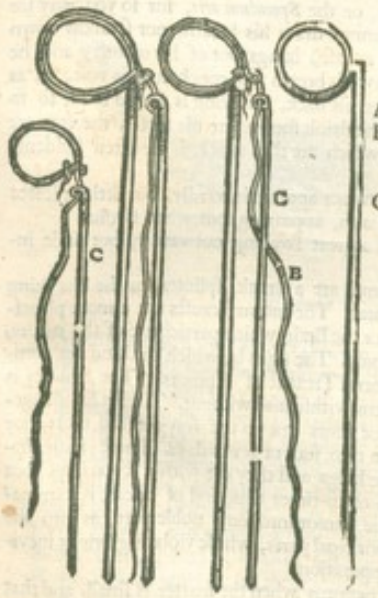
The cause of the swelling thereof.

many

many ſymptomes; for by the continual irritation of the diſtilling humor the cough is cauſed, which alſo hinders the ſleep, and intercepts the liberty of ſpeech; as alſo, by hindering reſpiration, the Patients cannot ſleep, unleſs with open mouth: They are exerciſed with a vain endeavouring to ſwallow (having, as it were, a morſel ſticking in their jaws) and are in danger of being ſtrangled. Symptomes.

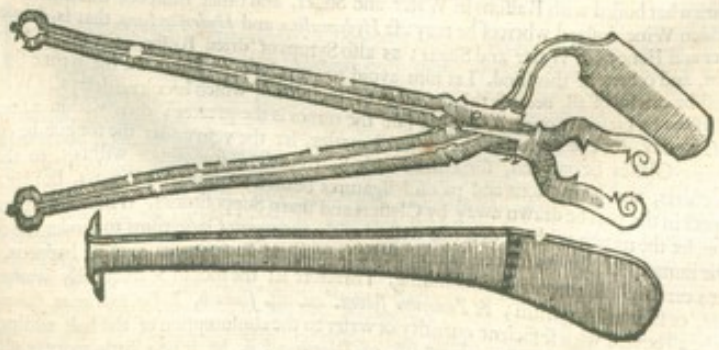
This diſeaſe muſt be reſiſted and aſſailed by purging, bleeding, cupping, taking of clyſters, uſing aſtringent Gargles, and a convenient diet; but if it cannot thus be overcome, the cure muſt be tried by a cauſtick of *Aqua fortis*, which I have divers times done with good ſucceſs. But if it cannot be ſo done, it will be better to put to your hand, than through idleneſs 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 judge the *Uvula* 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 ſmall by little and little into a ſharp, looſe and ſoft point; if it be neither exceeding red, neither ſwoln 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 *Uvula* with your Sizzers, and 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 Phyſician ordinary, and the chief Phyſician of the Queen-mother. Which alſo may be uſed in binding of *Polypi*, and warts in the neck of the womb. The Cure. The Cure by Chirurgery.

The Delineation of Conſtrictory-rings, fit to twitch or bind the Columella, *with a twiſted thread.*



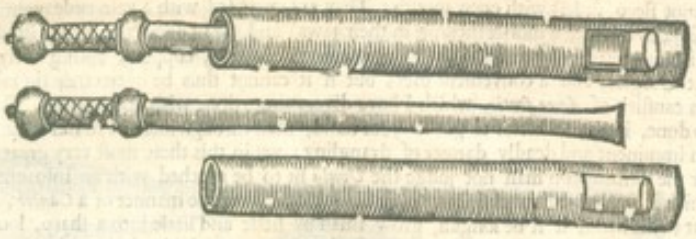
A *Shews the ring, whoſe upper part is ſomewhat hollow.*
B *A double waxed thread, which is couched in the hollowneſs of the ring, and hath a running, or looſe knot upon it.*
C *An Iron rod, into the eye whereof the forementioned double thread is put, and it is to twitch the* Columella, *when as much thereof is taken hold of, as is unprofitable, and ſo take it away without any flux of blood. When you would ſtraiten the thread, draw it again through the Iron-rod, and ſo ſtrain it as much as you ſhall think good, letting the end of the thread hang out of the mouth. But every day it muſt be twitched harder than other, until 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 Chirurgion is buſied in the cutting away, or binding the* Uvula.



But if an eating Ulcer ſhall aſſociate this relaxation of the *Uvula*, 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 differences.

The first kind.

The Symptoms.

The second kind.

The third.

The causes.

Hip. sect. 3. prog. 2. Aphor. 10. sect. 5.

Diet.

Cure.

Repelling Gargarisms.

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 lies hid behind the almonds or glandules of 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 Grey-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 voice is, as it were, drown'd in his jaws and nose; he cannot lie upon his back, but lying is forced to sit, so to breathe more freely: And because the passage is stopt, the drink flies out at his nose; the eyes are fiery and swoln, and standing out of their orb. Those which are thus affected are often suddenly suffocated, a foam rising about their mouths.

The second difference is said to be that, in which the tumor appears inwardly, but little or scarce any thing at all outwardly, the tongue, glandules and jaws, appearing somewhat swoln.

The third, being least dangerous of them all, causes a great swelling outwardly, but little inwardly.

The causes are either internal or external. The external are a streak, splinter, or the like thing sticking in the throat, or the excess of extreme cold or heat. The internal causes are a more plentiful defluxion of the humors either from the whole body or the Brain, which participate of the nature, either of blood, choler, or flegm, but seldom of Melancholy. The signs by which the kind and commixture may be known, have been declared in the general Treatise of Tumors. The Squincy is 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 ways of the meat, nor breath. Some die of a Squincy in twelve hours, others in two, four or seven days. Those (saith *Hippocrates*) which scape the Squincy, the disease passes to the lungs, and they die within seven days; but if they scape these days, they are suppurated; but also often-times 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 principal parts, whose violating brings inevitable death; sometimes by resolution, otherwise by suppuration.

The way of resolution is the more to be desired; it happens when the matter is small, and that subtle; especially, if the Physician shall draw blood by opening a vein, and the Patient use fitting Gargarisms. A critical 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 suddenly shut up. Broths must be used made with Capons, and Veal seasoned with Lettuce, Purslain, Sorrel, and the cold Seeds.

If the Patient shall be somewhat weak, let him have potched Eggs, and Barly Creams, the Barly being somewhat boiled with Raisons in Water and Sugar, and other meats of this kind. Let him be forbidden Wine, instead whereof he may use *Hydromelita*, and *Hydrosaccharæ*, that is, drinks made of Water and Honey, or Water and Sugar; as also Syrups of dried Roses, of Violets, Sorrel and Limmons, and others of this kind. Let him avoid too much sleep. But in the mean time the Physician must be careful of all, because this disease is of their kind, which brook no delays. Wherefore let the *Basilica* be presently opened, on that side the tumor is the greater; then within a short time ter the same day, for evacuation of the conjunct matter, let the vein under the tongue be opened; let Cupping-Glasses be applied, sometimes with Scarification, sometimes without, to the neck and shoulders, and let frictions and painful 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 Gargarisms to hinder the defluxion of the humor, lest by its sudden falling down it kill the Patient; as it often happens, all the Physicians care and diligence notwithstanding. Therefore let the mouth be frequently washed with Oxycrate, or such a Gargarism; R *Pomorum sylvest. nu.* iiij. *sumach, Rosar. rub. an. m. ſ. berber.* ʒ ii. let them be all boyled with sufficient quantity of water to the consumption of the half, adding thereunto of the Wine of sour 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, Verjuyce, Julep of Roses, and the like. But if the matter of the defluxion shall be Phlegmatick, Alum, Pomgranat-pill, Cypress-nuts, and a little Vinegar may be safely added. But

on

on the contrary, Repercuſſives muſt not be outwardly applied, but rather Lenitives, whereby the external 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 humour to begin to be reſolved, if the Feaver leave the Patient, if he ſwallow, ſpeak, and breathe more freely, if he ſleep quietly, and the pain begin to be much aſſwaged. Therefore then Nature's 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 Marſh-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-almons, or Violets warm, for ſuch things help forward Suppuration and aſſwage pain; let ſuppurating Cataplaſms be applied outwardly to the neck and throat, and the parts be wrapped with wool moiſtned with Oyl of Lilies. When the Phyſician 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.* ℥ i, *fiat gargariſma.* Alſo, the uſe of *oxomel*, that is, Wine and Honey, 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.

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 *Goetre*, 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 general 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 ſoever 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 actual or potential 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 Cure.

CHAP. X.

Of the Pleuriſie.

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 intercoſtal veins, and is at length poured forth into the empty ſpaces of the intercoſtal 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 urin, and ſometimes by ſtool.

What it is.

Of a Pleuriſie coming to ſuppuration.

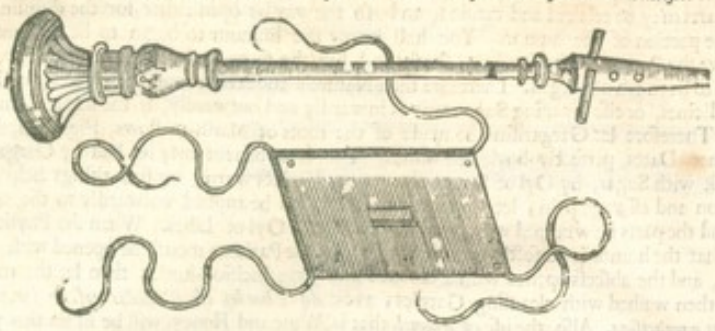
But if nature, being too weak, cannot expectorate the purulent blood poured forth into the capacity of the cheſt, the diſeaſe is turned into *Empyema*, wherefore the Chirurgeon muſt then be called, who beginning to reckon from below upwards, may make a vent between the third and fourth true and legitimate ribs; and that muſt be done either with an actual or potential cautery, or with a ſharp 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 actual 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 Phyſician, leſt the wavering hand might peradventure touch, and ſo hurt the other parts not to be meddled withal. The 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 change thereof into an *Empyema*.

Of the apertion of the ſide in an *Empyema*.

The

The Figure of an actual 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 ſeveral times; and the capacity of the cheſt cleanſed from the purulent matter by a detergent injection of vi. ounces of Barley-water, and ℥ ii, Honey 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 abundance 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 *Peritonæum* and entrails. From this diſtinction of places and matters, there ariſe divers kinds of Dropſies. Firſt, that Dropſie which fills 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 veſſel.

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 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 moſt ſubject to receive defluxions, and more remote from the fountain of the native heat; wherefore if you preſs them down, the print of your finger will remain ſometime after; the Patients face will 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 *Hydrocephalus* 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 incurable; 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 cauſes.

How divers diſeaſes turn into Dropſies.

Laſtly, All ſuch as have the menſtrual or hæmorrhoidal blood ſuppreſſed or too immoderately flowing contrary to their cuſtom, 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 external cauſes through which occaſion, errour may happen in diet or exerciſe.

The ſigns of an *Aſcites*.

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 ſwelling of the *Abdomen*. And alſo when the body is moved or turned upon either ſide, you may hear a ſound as of the joggling of water in a veſſel 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 of the midriff; 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 learn'd 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

The Symptomes.

lies

lies on his back, the tumor seems less, 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 swell by the flowing down of the serous and waterish humor to them. The pulse is little, quick, and hard with tension.

This disease is of the kind of Chronical 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, and old; and lastly, all such as have the natural faculty languishing and faulty. Prognosticks.

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 Physician, 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 formerly used and tried these. Therefore, it shall be the part of the Physician to prescribe a drying diet, and such medicines as carry away water, both by stool and urine, *Hippocrates* ordains this powder for Hydropick persons. ℞ *Cantharr. ablatis capitib. & aliis* ʒ β *comburantur in furno, & fiat pulvis*; of which administer two grains in white wine; for, nature, helped by this, and the like remedies, hath not seldom been seen to have cured the Dropsie. But that we may hasten the cure, it will be available to stir up the native heat of the part by application of those medicines which have a discussing force; as bags, baths, ointments, and Emplaisters. Let bags be made of dry and harsh Bran, Oats, Salt, Sulphur, being made hot; or, for want of them, of Sanders or Ashes often heated. *Hip. lib. 4. de acut. & lib. de intern.* Bags.

The more effectual baths are Salt, Nitrous, and Sulphurous waters, whether by nature or art, that is, prepared by the dissolution of Sal, Nitre, and Sulphur; to which if Rue, Marjoram, the leaves of Fennel, and tops of Dill, of *Stœchas*, and the like, be added, the business will go better forwards. Let bags be made of the oyl of Rue, Dill, Bays, and Squills, in which some *Euphorbium*, Pellitory of *Spain*, or Pepper, have been boiled. Let Plaisters be made of Frankincense, Myrrh, Turpentine, *Costus*, Bayberries, English Galengal, Honey, 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 *Phœnigmes*, 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 until the humor be exhausted, and the Patient restored to health. Baths. Liniments. Emplaisters. Vesicatories.

Galen writes, the Husbandmen in *Asia*, when they carried wheat out of the Countrey into the City in Cars, when they would 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 increase both the quantity and weight. When certain pragmatical 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. *Gal. lib. de fac. col. natur.* 1.

But if the Physician 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 Physicians have been diverse, we will produce and explain them. Divers opinions of *Paracentesis*, or opening of the belly.

Those therefore which disallow *Paracentesis*, conclude it dangerous for three reasons: The first, because by pouring out the contained water, together with it, you dissipate and resolve the spirits, and consequently the natural, vital, and animal 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 midriff 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 bloodless 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 poured 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, the thirst, the hot and dry distemper of the bowels, all which were mitigated by the touch of the included water, are aggravated by the absence thereof, being poured 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. Reasons against it. *Erasistratus* his reasons against it.

For, for the first, *Galen* infers that harmful dissipation of spirits, and resolving the faculties happens, when the *Paracentesis* is not diligently, and artificially performed. As in which the water is prudently poured forth; truly, if that reason have any validity, Phlebotomy 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 exquisite sense of the part, which in the *Peritonæum* ill affected and altered by the contained water, is either none or very small. But reasou Reasons for it.

and

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 that which adheres ſo ſtraitly to the muſcles of the *Abdomen*, that the diſſector cannot ſeparate it from the fleſh, but with much labour. But the reaſon which ſeems to argue the unprofitableneſs of *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 original from the liver, yet unleſs the water which ſtayeth there contrary to Nature be evacuated, it hurteth both the liver, and the reſt of the inner parts, whilſt it either increaſeth 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 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 Phyſician, 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 hapned either by the default of the flow or negligent adminiſtration of the *Paracenteſis*. I will add this one thing which may take away all errour or controverſie; we unwiſely doubt of the remedy when the Patient is brought to that neceſſity, that we can only help him by that means.

Lib. 3. cap. 22.

Lib. de morb. Ch. cap. de Hydrope.

The places of the apertion muſt be divers according to the parts chiefly affected.

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 breadth below the navel, to wit, at the ſide of the right muſcle, but not upon that which they call the *Linea Alba*; neither upon nervous parts of the reſt of the muſcles of the *Epigaſtrium*; that ſo we may prevent pain and difficulty of hearing. Therefore we muſt have a care that the Patient lye upon his right ſide, if the Inciſion be made in the left, or on the left, if in the right. Then the Chirurgion 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 he 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 kall or guts.

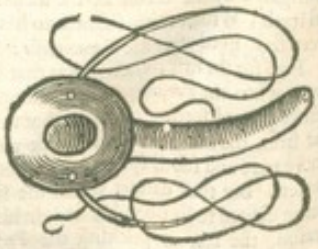
The manner of making apertion.

Then put into the wound a trunk, or golden, or ſilver crooked pipe, of the thickneſs of a Gooſe-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 ſponge 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 rejoyce at the pouring forth of the water, as if he had been freed from the humor and the diſeaſe, but died within a few hours, becauſe the force of the water running forth, could by no means be ſtaid, for the Inciſion was not artificially made. But it will not be ſufficient to have made way for the humor by the means afore-mentioned, but alſo the external orifice of the pipe muſt be ſtopped and ſtrengthened by double clothes, and a ſtrong ligature, leſt any of the water flow forth againſt our wills. 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 ſtayed for ſome days, which at the length performed according 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.



Another manner of evacuating the water after the apertion.

Others perform 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 fleſhy 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 will. Sometimes ſuch as are cured and healed of the Dropſie, fall into the Jaundiſe, whom I uſually cure after this manner. R. *ſterc. anſer.* ʒ ij. diſſolve it in ℥ iij, *vini. alb. coletur:* Make a Potion, and let it be given two hours before meat.

A medicine for the Jaundiſe.

CHAP.

CHAP. XIII.

Of the tumor and relaxation of the Navel.

THe *Exomphalos* or ſwelling of the navel, is cauſed by the *Peritonæum*, either relaxed or broken; for by this occaſion oft-times the guts, and oft-times the kall, fall into the ſeat of the navel, and ſometimes ſuperfluous fleſh is there generated; otherwiſe, this tumor is as an *Aneurifma* by too great a quantity of blood 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 recide without noiſe, either by the preſſure of your fingers, or of it ſelf when the Patient lieth on his back; but tumor cauſed by the guts, is more unequal, 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 preſs it with your fingers.

The divers cauſes thereof.

Signs hereof occaſioned by the kall.

By the guts.

By Fleſh.

The tumor is ſofter which proceeds of wind, but which will not retire into the body, and 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 arterial, then there are the ſigns of an *Aneurifma*. Wherefore when the tumor is cauſed by the guts, kall, wind or a wateriſh humor, it is cured by Chyrurgery; but not if it proceed from a fleſhy excreſcence or ſuffuſion of blood. The tumor of the navel 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 ligature. 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 navel 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.

By wind.

By a wateriſh humor.

By bruiſed blood.

Which may be cured by Chirurgery, which not.

The cure by Chirurgery.

CHAP. XIV.

Of the Tumors of the Groins and Cods called Herniæ, *that is, Ruptures.*

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 do not forſake their places.

There are only three ſorts of Ruptures.

The Greeks have given to all theſe ſeveral 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 *Entero-epiplocele*: but if the tumor proceed from a wateriſh humor, they term it *Hydrocele*: if from wind, *Phyſocele*; if from both, *Hydro-phyſocele*; 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 ways, ſhall be ſwoln in the cod and teſticles, the tumor obtains the name of a *Cirſocele*. 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 ſtroke, 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 burthen, racking, alſo the too immoderate uſe of viſcid and flatulent meats; for all ſuch things may either relax or break the *Peritonæum*, 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, 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 do not only mutually ſucceed each other, but by a certain conſequence do, 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 natural, into that againſt nature: None of all which can befal 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 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 to the *Peritonæum* being broken: for the way being once open, and paſſable to the falling body, the tumor is renewed without any diſtention, and ſo without any pain to ſpeak of.

Bubonocele.

Enterocele and *Epiplocele.*

Hydrocele.

Phyſocele.

Sarcocele.

Cirſocele.

The cauſes.

The ſigns.

The reſt of the ſigns ſhall be handled in their places. Sometimes it happens that the guts and kall, do firmly adhere to the proceſs 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, too long ſtay of the gut in the cod, and the neglect of wearing a Truſs, 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 ſeldom 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 largeneſs of the place and Rupture, ſo alſo they may eaſily return.

What Rupture is uncureable.

CHAP. XV.

Of the Cure of Ruptures.

To what Ruptures children are ſubject.

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 continual and painful 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 thighs higher; then ſhall he force with his hands by little and little, and gently, the gut into the 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: R *Præſcript. decoctionis quantum ſufficit, farinæ hordei & faburum, an.* ℥ i, *pulver. Aloes, Maſtiches, Myrtill. & Sarcocc. an.* ℥ ß, *Boli Armeni* ℥ ij. Let them be incorporated and made a Cataplaſm according to art. For the ſame purpoſe he may apply *Emplaſtrum contra Rupturam*: 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 thirty or forty days, as we mentioned before; and keep him from crying, ſhouting, and coughing; *Actius* bids, ſteep paper three days in water, and apply it made in a ball to the groin, the gut being firſt put up; for that remedy by three days adheſion will keep it from falling down. But it will be, as I ſuppoſe, more effectual, it 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 the 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 fore-mentioned 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.

An aſtringent Cataplaſm.

Sect. 1. *c.* 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 honey 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 days: The part for other things being bound up with a Ligature and Truſs 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, joyns 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 adjoyning 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 we muſt deſpair of nothing in this diſeaſe, for the cure may happily proceed in men of full growth, as of forty 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 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 Truſs; and he followed my directions. When I met him ſome five or ſix years after, I asked him, How he did? he anſwered, Very well, for he was wholly freed from the diſeaſe, 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 months 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 proceſs 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

A notable Hiſtory.

We muſt never deſpair in diſeaſes, if ſo be Nature be aſſociated by Art.

his

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 we firmly stay the gut in its place, after the same manner as these two Figures shew.

The Figure of a man broken on one side, wearing a Truss whose Bolster must have three Tuberosities, two on the upper, and one on the lower part; and there must be a hollowness between them in the midst, that they may not too straitly press the share-bone, and so cause pain. The manner of such a Truss, I found out not long ago, and it seemed better and safer than the rest for to hinder the falling down of the gut and kall.

A *Shews the shoulder-band which is tied before and behind to the girdle of the Truss.*
B *The Truss.*
C *The Cavity left in the midst of the Tuberosities.*

Another Figure of a Man having a Rupture on both sides, shewing by what means, with what kind of 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.*

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 his head low, and his knees higher let the following Cataplasms be applied.

℞ *Rad. alth. & lil. ana* ℥ ij. *Seminis lini & fenugr. an.* ℥ ß, *fol. malvæ, & viol. parict. 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 Oyl of Lilies as much as shall suffice. Make a Cataplasm in the form of a liquid Pultis. Let it be applied hot to the end, and bottom of the belly; by the help of this remedy when it had been applied all night, the guts have not seldom been seen of themselves, without the hand of a Chirurgeon, to have returned into their proper place. The windiness 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 go back thus, the flatulencies, yet resisting undiscussed, an emollient and carminative clyster is to be admitted, with a little Chymical Oyl of Turpentine, Dill, Juniper, or Fennil. Clysters of Muscadine, Oyl of Walnuts, and *Aqua vitæ*, and a small quantity of any the aforesaid Oyls, are good for the same purpose.

A Cataplasm to soften the excrements.

Chymical 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 increaſe by the acceſs of flatulences 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 ſymptom, you muſt rather aſſay extreme remedies, than ſuffer the Patient to die by ſo filthy and loathſom 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 gut; then we muſt have a ſilver Cane or Pipe, of the thickneſs of a Gooſe-quil, 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.

The Chirurgical cure by the Golden tie.

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 production, 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 future; 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.*

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 undergo 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-ways under the proceſs of the *Peritonæum*, and by lifting it up, ſeparate it from the adjoyning 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 proceſs 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 ſhall with a needle, having five or ſix threds, thruſt it through as near as he can to the ſpermatick veſſels, and Cremaſter muſcles. But the needle alſo muſt be drawn again in to 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 and 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 cleanſed, filled with fleſh, and cicatrized, whoſe callous hardneſs may withſtand the falling of the gut or kall.

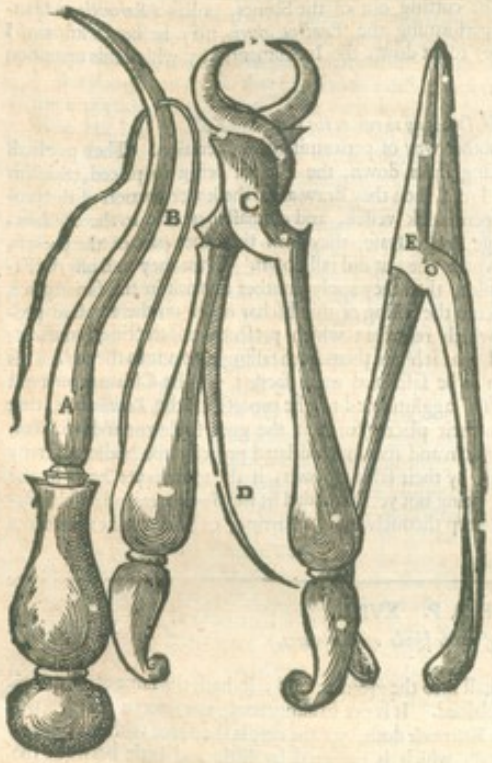
Another manner thereof.

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 looſneſs 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,

left

left with the sharpness they 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 days 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.



A *Shews 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 of the needle.*

C *The Mullets or Pincers, to cut away the waste or superfluous ends of the wire.*

D *The spring of the Mullets.*

E *The Mullets to twist the ends of the wire together.*

There is also another manner of this Golden tie, which I judge more quick and safe, even for that there is no external body left in that part after the cure. Wherefore they wrap a leaden wire instead of the golden, which comes but once about the process of the *Peritonæum*, then 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 hindering the passage of the spirits and nourishment. The ends thereof are suffered to hang out; when in the 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 Physician, for it divers 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 believe that it is an *Enterocele*. Therefore whilst he labours by repelling medicines and trusses to force back this tumor, he increaseth the pain, and hinders the falling down of the testicles into the cod. I observed this not long ago in a Boy, which an unskilful Chirurgion had long, and grievously troubled, as if he 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 wish'd 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.

That the reason of this affect may be understood, we must know that 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, until at length they are forc'd down into the cod by youthful 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 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 while 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 days 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 Eunuchs 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 human actions, their life cannot but be miſerable. Wherefore I will 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 (in the foregoing page) to ſet down 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 in the *Scotum*, or cod, if the Patients be not come to ſuch age, as they can keep themſelves from ſtirring, or hold their excrements while 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 evil ſymptoms, 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 *Dartos* and *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.

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.

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.

A medicine to draw forth the contained matter.

℞ *Ung. 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 yield 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 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 breadth long, penetrating even to the contained water; always leaving untouched the ſubſtance of the teſticles and veſſels, and they keep the wound open, until 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 general.

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, levity, renitency and ſhining. It is cured by preſcribing a convenient diet, by the application of medicines which reſolve and diſcuſs flatulencies, as the ſeeds of Annis, Fennel, Fenugreek, *Agnus Caſtus*, *Rue*, *Origanum*, and other things ſet down by *Avicen* in his Treatiſe of Ruptures. I have often uſed, with good ſucceſs for this purpoſe, *Emplaſtrum Vigo-*

nis

nis cum Mercurio; and *Emplastrum Diacalcitheos*, dissolved in some good Wine, as Muscadine with Oyl of Bays.

What a *Sarcocele* is. A *Sarcocele* is a Tumor against Nature, which is generated about the stones by a scirrhous flesh. Gross 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. The Signs. *Varices*, or swolln veins often associate this tumor; and it increases with pain. Prognostick. It 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 man think, that he in such a case may somewhat ease the Patient by the cutting away of some portion of the same soft flesh, he is deceived. For a *Fungus* will grow, if the least portion thereof be but left, being an evil far 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 mutual implication about the testicle and cod, and swelling with a gross and melancholy blood. 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 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 blood: That so this gross 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 blood 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 cures 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 pass 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 Bloody-flux gives occasion to this effect. A strong endeavour to expel 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 stroke or fall 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 local medicines the part must be fomented with an astringent decoction made of the rinds of Pomegranats, Galls, Myrtles, Knotgrass, 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 swathe, to the midst whereof behind let another be fastned which may be tied at the *Pubes* coming along the *Peritonæum*, 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 wilhed when he goes to stool, that he sit upon two pieces of wood being set some inch asunder, lest by his straining he thrust forth the gut together with the excrement; but if he can do it standing, he shall never by straining 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

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 *Periſteum* is communicated to the tendons and nerves of that part which it affecteth, whereof cruel ſymptoms do follow, as pulſifick 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 mortal; wherefore you muſt provide a skilful Phyſician for the cure of this diſeaſe, which may appoint convenient diet, purging and blood-letting. In the mean time the Chirurgeon ſhall 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 joynt thereof; for *Vigo* ſaith, there is not a preſenter remedy, if ſo be that it be quickly done, and before the mutaration 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 virulency.

Lib. cap. 4. trall.

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 Treacle being diſſolved may draw forth the virulency. But to appeaſe the pain, the ſame remedies muſt be applied to the affected part as are uſed in Carbuncles, as the leaves of Sorrel, Henbane, Hemlock, Mandrake roaſted under the Embers, and beaten in a Mortar with new *Unguentum Populeon*, or Oyl of Roſes, or new Butter without Salt: For ſuch like medicines alſo help forward ſuppuration; whilſt by their coldneſs, they repreſs the extraneous heat affecting the part; and ſo ſtrengthen the native heat, being the author of ſuppuration: Which reaſon moved the ancient Phyſicians to uſe ſuch medicines in a Carbuncle; but if by reaſon of the fearfulneſs of the Patient, or unskilfulneſs of the Chirurgeon, no inciſion be made, a Gangrene 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 ſeldom 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, diſſolves 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. ſect. 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 evil 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 tumor 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 and malign quality, whether it be cold or hot, when it hath ſettled 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 refrigerating diet be appointed, and Phlebotomy for the revulſion of the antecedent cauſe; divers local medicines ſhall be uſed, according to the variety of the four times. But for to aſſwage the pain, *Anodynes*, 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 unconſiderately, for fear of pain and evil 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 preſſures 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 inſtead of the humor, cauſeth evil ſymptoms by reaſon of the Section raſhly made in a part ſo ſenſible.

But if watery humors ſhall tumefie the part, the body ſhall firſt be purged with medicines purging flegm: And then inciding, attenuating, rarifying, diſcuſſing, and very drying local medicines ſhall be uſed.

Of which we have abundantly ſpoken in the Chapter of the *Oedema*. Yet this humor divers times lies deep between the whirl-bone and the joynt, which cauſeth it that it cannot 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

In which case, 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.

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 and 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. It is not as yet sufficiently known what *Dracunculi* are.

For first, for *Galen*'s opinion, *Lib. 6. de Loc. affect. cap.* 3. The generation, saith he, of those hairs which are evacuated by the urin 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 original nor essence. *Lib. 4. cap. ult.*

Paulus Ægineta writes, that the *Dracunculi* are bred in *India*, and the higher parts of *Egypt*, like Worms in the musculous parts of mans body, that is, the arms, thighs and legs, and also creep by the intercostal muscles in children with a manifest motion.

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 pluck'd away piece-meal with the fingers: Also suppurating Cataplasms may be applied, composed of Water, Honey, Wheat and Barley-meal. The cure out of *Ægineta*.

Avicen being various, having no certainty whereon to rest, inclineth one while to this, and anily other 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.

Aetius 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. *cap.* 21. *lib.* 4. *sect.* 3. *tract.* 3.

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. *Lib.* 14. *cap. ult.*

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. The cure out of *Aetius*.

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 usual with him after the taking away of the Cataplasms, to apply *Emplastrum è Baccis Lauri*: But when it is come to suppuration, the skin must be opened longways, 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.

Rhasis writeth, that when the part is lifted up into a blister, and the vein hasteneth 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 its self into its skin and its lurking hole, and so cause a putrid and malignant Ulcer. *Trallat.* 7. *c.* 34. 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, until 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-ways with an Incision-knife, and that so that whatsoever remains thereof may be wholly taken away. Then for some days the part must be anointed with butter until whatsoever of such a substance adheres, being consumed with putrefaction shall flow away. Then the Ulcer must be cured with sarcotick things.

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. His opinion of them.

Soranus the Physician, who lived in the times of *Galen*, was of a quite contrary opinion, as *Paulus Ægineta* 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 Physician and Patients to have some motion under the skin. *Soranus* his opinion.

Wherefore *Soranus* seems to have come nearer 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 evil and unlaudable blood, groſs, hot, and melancholick; or of aduſt phlegm very much dried.

Gorræus a moſt learned Phyſician of our time, *Lib. de Definitionib. medic.* denies any of our Phyſicians to be able to ſay any thing of the *Dracunculi*, becauſe it is a diſeaſe ſo unfrequent in theſe our Regions, that it is ſcarce ever met withal in practice.

The Author of the Introduction, and Medicinal 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 ſeems chiefly to have moved *Guido* to refer this kind of diſeaſe to the *Varices* in his Tractate of Impoſthumes, 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 ſeveral Writers, yet they have all expreſſed it by the name of a Vein, for it is called by *Avicen* and *Guido*, *Vena Meden*, becauſe it is a diſeaſe frequent in the City *Medina*: by *Albucraſis*, *Vena Civilis*. *Haliabas* 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 later Phyſicians have written any thing 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 ampler 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 undergo the cenſure of being thought too daring, than (as much as in me lieth) 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.

Actius opinion confuted. *Tract. 3. ſerm. 1. cap. 40.*

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 calls *Tænia*, is, as it were, a certain *Metamorphoſis*, or Tranſmutation, of the inner tunicle of the ſmall guts into a quick living and moveable body.

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 adjoyned; but much leſs from the skin under which they lie, may they draw the material cauſes of their original.

Moreover, neither can there be any generation of Worms, nor of any other living Creatures whatſoever, who have their original from putrefaction, unleſs by the corruption of ſome matter, of whoſe better and more benign part, Nature by the force of the vital 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 concur as aſſiſtant to the principals in the action. And it is meet the place ſhould be opportune or fit. *4 Meteorolog.*

Natural Melancholick humors is moſt unapt to putrefie.

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, terreſtrial and groſs, which by its qualities both by the firſt coldneſs and drineſs, as alſo by the ſecond, that is Acidity, is not only thought moſt unfit of all others for putrefaction, but alſo is is judged to reſiſt putrefaction, as that which is cauſed by heat and ſuperfluous humidity. Beſides, if the material cauſe of this diſeaſe ſhould be from a 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.

Stink, an unſeparable companion to putrefaction.

Therefore that which exhales from their bodies who are troubled with the *Dracunculi*, ſhould be ſtinking, as it happens to thoſe ſick of the *Phthiriaſis* or *Lowſie-evil*. But none of thoſe who have delivered the accidents or ſymptoms of the *Dracunculi* are found to have made mention hereof; but of 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 feign our bodies to be fruitful 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 material and efficient cauſes being defective, or certainly very weak, for the generation of ſo laborious an effect; what coadjutory cauſe can yield 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 *Avicen* 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 Endemial diſeaſe, confer any thing to the generation of ſuch creatures? Certainly, for this purpoſe in 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 bred of putrefaction.

But

But on the contrary, *Jacobus Dalechampius* by the opinion of all the Physicians 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 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 Bulwarks, with which this old opinion of the *Dracunculi* may stand and be defended. *Cap. 83. Chir. Gallic.*

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 adjacent 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 wrinkled, 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 subtil 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 express the crooked creeping of a Serpent. But they will say, pain happens not unless to things indued with sense and life, but this *Dracunculus* when he is drawn too violently, especially if he be broken, thereby will cause extreme pain: We do answer, that the conclusion doth not follow, and is of no consequence; for these pains happen not, unless when the unprovident Surgion draws or pulls instead of the *Dracunculus* some nervous or membranous body swoln and repleat with adust humor, whence there cannot but be great pain, that part being pull'd 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 determine 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 external 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 stretch-forth strait, 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*.

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. The Cure.

The mention of the *Dracunculi* calls to my memory another kind of Abscess, altogether as rare. This our *French* men name *Cridones*, I think *a Crinibus*, i. from hairs: It chiefly troubles children, and pricks their back like thorns. They toss up and down being not able to take any rest. This disease ariseth from small hairs which are scarce of a pins length, but those thick and 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 Physicians. So the *Malum pilare* in *Aristotle, cap.* 11. *lib.* 7. *hist. animal.*

The end of the Eighth Book.

THE

BOOK IX.

Of Wounds in general.

CHAP. I.

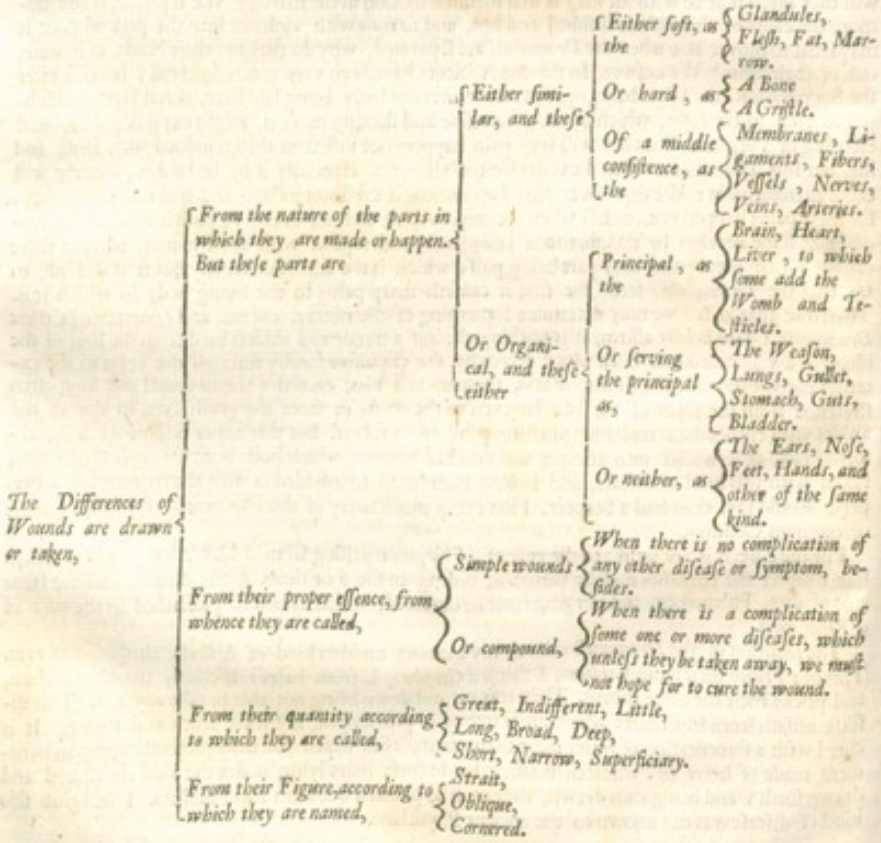
What a Wound is, what the kinds and differences thereof are, and from whence they may be drawn or derived.

What a wound properly is.

A Wound is a folution of Continuity, caufed by a ftroke, fall, or bite, newly done, bloody, and with putrefaction and filth. They alfo call it a new fimple Ulcer; for the folution of Continuity happens to all parts of the body; but according to the diverfity of parts, it hath divers names amongft the Greeks. For in the flefh it is called *Helcos*, in the bone *Gatagma*, in the nerve *Spafma*, in the ligament *Thalaffma*, in the veffels *Apoßafma*, in the mufcles *Regma*; and that folution of Continuity, which happens in the veffels, their mouths being open, is termed *Anaftomofis*; that which happens by erofion, *Aneurofis*; that which is generated by fweating out and tranfcolation, *Diapedefis*. That thefe may be the more eafily underftood, I have thought good to defcribe them in the following Table.

Divers appellations of wounds according to the varieties of the parts.

A Table of the differences of Wounds.



CHAP. II.

Of the caufes of Wounds.

Divers denominations from their caufes.

ALL things which may outwardly aflail the body with force and violence, may be counted the caufes of wounds; which are called green, and properly bloody. Thefe things are either animate, or inanimate, as the bitings and prickings of Beafts. The inanimate, as the ftroke of an Arrow, Sword, Club, Gun, Stone, a Dagger, and all fuch like things.

From the variety of fuch like caufes, they have divers names: For thofe which are made by fharp and pricking things are called Punctures: Thofe caufed by cutting things, are called Wounds or Gafhes; and thofe which are made by heavy and obtufe things are named Contufions, or wounds with contufions.

CHAP.

CHAP. III.

Of the Signs 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 scarce 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 greatness of the wound hath slain. A caution for making reports of Wounds.

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 doubtful state of the Wound, that if Art shall be overcome by the greatness thereof, he shall not be thought ignorant of the Art, neither to have deceived them.

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. A jugling cheating Chirurgeon.

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 small, may by his negligence become great. Therefore it is expedient he should know what Wounds are to be accounted great.

This (as *Galen* saith) is three ways 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 greatness 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 those 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. *Lib. 4. Meth. cap. 6. 1.* Wounds are called Great, out of three respects.

CHAP. IV.

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 evil, which are upon the Arm-pits, Groins, Legs, Joints, and between the Fingers; and likewise those which hurt the head or tail of a Muscle. They are least dangerous of all other which wound onely 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 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 unless 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 disjoined, which happens to round Wounds. Contrary to these are cornered Wounds, or such as are made alongst the fibers, as such as may be healed. What wounds are dangerous. What least dangerous. What deadly. *Hipp. 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 fruitful, or good blood, by which the loss of the flesh may be the better and more readily restored, which is slowlier done in old bodies, 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 excess of heat and cold is hurtful 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 Brain suffering together therewith, as that which is the Original of the Nerves. A tumor coming upon great Wounds is good; for it shews the force of nature is able to expel that which is harmful, and to ease the wounded part. The organical parts wholly cut off, cannot again be united: because a vital 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 repostion of the like, but not of the same substance. The first intention takes place in the fleshy parts by converting the Alimentary blood into the proper substance of the wounded part. But the second, in the spermatick 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 original matter is from an humour somewhat grosser than that, from whence the Bones have their original and beginning. *Hipp. lib. de alter. Hipp. aph. 66. lib. 5.* What a *callus* is, and whence it proceeds.

This humour, 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 judge deadly, do divers times kill by reason of a certain occult and all dispotition of the wounded; Small and contemptible wounds often prove mortal.

Aphor. 1. *Sect.* 1. wounded, and encompaſſing bodies; for which cauſe we read it obſerved by *Hippocrates*, that it is not ſufficient for the Phyſician to perform his duty, but alſo external things muſt be rightly prepared and fitted.

CHAP. V.

Of the Cure of Wounds in general.

The general Indication of Wounds.

THe Chirurgeon ought for the right cure of Wounds to propoſe unto himſelf the common and general 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 disjoined deſires to be united, becauſe Union is contrary to Diviſion. But by what means ſuch Union may be procured, is onely known to the skilful Artiſan. Therefore we attain unto this chief and principal 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 body, as pieces of Wood, Iron, Bones, bruiſed Fleſh, congealed Bloud, or the like, whether they have come from without, or from within the Body, and ſhall be by accident faſtned or ſtuck in the Wound, he muſt take them away, for otherwiſe there is no Union to be expected.

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 Phyſician is often forced to change the order of the Cure.

All ſtrange and external 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 principal part, or other ſerving the principal.

Yet if by the quick and too haſty taking forth of ſuch like Bodies there be fear of cruel pain or great effuſion of bloud, 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 bloud, Swooning, Convulſion, and other horrid ſymptoms, follow upon the too rough and boiſtrous 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 faſtned more ſtraitly or more looſly; and then for fear of inferring any worſe harm, as the breaking of ſome Veſſel: but how we may perform this firſt intention, and alſo the expreſſion of the inſtruments neceſſary for this purpoſe, ſhall be ſhewn in the particular Treatiſe of Wounds made by Gun-ſhot, Arrows, and the like.

Ligatures and Sutures for to conjoin and hold together the lips of Wounds.

But the Chirurgeon ſhall attain to the ſecond and third ſcope of curing Wounds by two and the ſame means, that is, by Ligatures and Sutures: which notwithſtanding before he uſe he muſt well obſerve whether there be any great flux of Bloud preſent, for he ſhall ſtop it if it be too violent, but provoke it if too ſlow, (unleſs by chance it ſhall be poured out into any capacity or belly) that ſo the part freed from the ſuperfluous quantity of Bloud 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 onely 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 onely in need of the Ligature which we call Incarnative, eſpecially if it be in the Arms or Legs, but that which divides the Muſcles tranſverſly, 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 conjoined.

If any portion of a fleſhy ſubſtance by reaſon of ſome great Cut, ſhall hang down, it muſt neceſſarily be adjoined 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.

What an Incarnative Ligature is.

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 bloudy 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 join 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 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 bottom of the *Sinus*, or boſom thereof, and there it muſt be bound more ſtraitly, and ſo by little and little going higher, you muſt remit ſomething of that rigour even to the mouth of the Ulcer, that ſo (as we have ſaid) the ſanious matter may be preſſed forth.

The

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 local Medicins. It is performed with a Rowler, which consists somewhiles of one, somewhiles of more heads. All these Rowlers ought to be of Linnen, and such as is neither too new, nor too old, neither too coarse nor too fine. Their bredth must be proportionable to the parts to which they shall be applied; 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 retentive.

What the rowlers must be made of.

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 Physician, by using universal and local Medicins. A slender, cold and moist Diet must be observed, until 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 Barley or Liquorice, or Water and Sugar. He shall keep himself quiet, for Rest is (in *Celsus*'s opinion) the very best Medicin. 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. Universal 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 always necessary, as in small Wounds and Bodies, which are neither troubled with ill humours, or Plethorick: But it is onely 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 Joints, Tendons, or Nerves are wounded. Gentle purgations must be appointed, because the humours are moved and enraged by stronger; whence there is danger of defluxion and inflammation: wherefore nothing is to be attempted in this case without the advice of a Physician.

In what wounds bloud letting is not necessary.

The Topick and particular Medicins are Agglutinative, which ought to be endued with a drying and astrictive quality, whereby they may hold together the lips of the Wound and drive away defluxion, having always a regard to the nature of the part, and the greatness of the disease. The Simple Medicins are *Olibanum*, *Aloes*, *Sarcocolla*, *Bole Armenick*, *Terra sigillata*, *Sanguis Draconis*, Common and Venice Turpentine, Gum, *Elemni*, Plantane, Horsetail, the greater Comfry, *Farina Volatilis*, and many other things of this kind, which we shall speak of hereafter in our *Antidotary*.

What Medicins are to be judged agglutinative.

The fifth scope of healing Wounds, is the correction of those Symptoms or Accidents which are accustomed to follow Wounds, which thing verily makes the Chirurgeon have much to do; for as he is often forced to omit the proper cure of the Disease, so to resist the accidents and symptoms, as Bleeding, Pain, Inflammation, a Fever, 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 thing fitting for this place.

CHAP. VI.

Of Sutures.

What wounds stand in no need of a Suture.

When Wounds are made alongst the Thighs, 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 joined and so kept, they must be sewed, and if the Wound be deep, you must take up much flesh with your Needle; for if you onely take hold of the upper part, the Wound is onely superficially healed: but the matter shut up, and gathered together in the bottom of the Wound, will cause abscesses and hollow Ulcers: Wherefore now we must treat of making of Sutures.

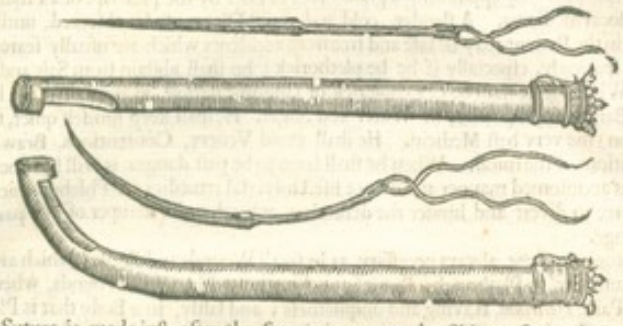
The first called *Interpunctius*, leaves the distance of a fingers bredth, and therefore is fit for the green Wounds of the fleshy parts, which cannot be cured with a Ligature, and in which no heterogeneous or strange body remains. It is performed after this manner. You must have a smooth Needle with 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, whilest 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, near to which cut off the Thred, lest that if any of it be left below the knot, it may so stick to the Emplaisters 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 be 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 be so much distended that they may easily be broken by the stiffness of the Thred. But you must neither take hold of too much nor too little flesh with your Needle;

The first manner of Suture. The form of your Needle.

The form of the Pipe with a window in it

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 needful 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 shall serve.

The Figures of Pipes with Fenestels in them, and Needles fit for Sutures.



The second means of Suture.

The second Suture is made just after the same manner as the Skinner sows their Fells 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 Boys use to fasten their Needle, for fear of losing it, in their Caps or Cloths. 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 fourth 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 *Peritonæum* lying under them. The manner whereof we shall shew in due place.

The fifth kind called the Dry Suture.

The fifth kind is called the dry Suture, which we use onely 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 vital 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 ways of stanching blood.

The first way of staying bleeding.

The first and most usual is that, by which the lips of the Wound are closed, and, unless it be somewhat deep, are contained by Medicins which have an astringent, cooling, drying, and glutinous faculty: As *Terræ sigill. Boli Armeni, ana* ʒ ß. *Thuris, Mastichis, Myrrhæ, Aloes, ana* ʒ ij. *Farinæ volat. molend.* ʒ i. *Fiat pulvis quâ albumine ovi excipiatur.* Or, ℞ *Thuris & Aloes, ana partes æquales.* Let them be mixt with the White of an Egg, and the Down of a Hare, and let the pledgets be dipped in these Medicins, as well those which are put unto the Wound, as those which are applied about it. Then let the Wound be bound up with a double cloth and fit ligature, and the part be so seated as may seem the least troublesom and most free from pain.

The 2. manner of stanching it

But if the Blood cannot be staid by this means, when you have taken off all that covereth it, you shall press the Wound and the orifice of the Vessel with your Thumb, so long until 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 staid, then the Suture (if any be) must be opened, and the mouth of the Vessel towards the original 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 its place. To perform this Work we are often forced to divide the skin which covereth the wounded Vessel. For if the Jugular Vein or Artery be cut, it will contract and draw it self upwards and downwards. Then the Skin it self must be laid open under which it lieth, 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 stop the mouth of the Vessel, lest it should then bleed.

An admonition.

The 4. way by Eschaoricks.

But if the condition of the part shall be such as may forbid this comprehension, and binding of the Vessels we must come to *Eschaoricks*, such as are the powder of burnt *Vitriol*, the powder of Mercury, with a small quantity of burnt Allum; and Cauticks which cause an Eschar. The falling away of which must be left to Nature, and not procured by Art, lest it should fall away before that the orince of the Vessel shall be stopt with the flesh or clotted blood.

The 5. way by cutting off the Vessels.

But sometimes it happens that the Chirurgeon is forced wholly to cut off the Vessel it self, that

that thus the ends of the cut Veſſel withdrawing themſelves, and ſhrinking upwards and downwards, being hidden by the quantity of the adjacent and incompaſſing parts, the flux of the bloud, which was before not to be ſtaid, may be ſtopped with leſs labour. Yet this is an extreme remedy and not to be uſed, unleſs you have in vain attempted the former.

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 always cauſes a defluxion, of how good ſoever a habit and temper the body be of; for Nature ready to yield aſſiſtance to the wounded part, always ſends more humours to it than are needful for the nourishment thereof, whereby it comes to paſs 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 medicins be applied to the part as have a repelling and mitigating faculty; as ℞ *Olei Myrtili, & Roſarum, ana* ℥ ij. *Ceræ alb.* ℥ i. *Farinæ hordei,* ℥ ß. *Boli armeni, & terræ ſigillat. ana* ʒ vj. Melt the Wax in the Oils, then incorporate all the reſt, and according to Art, make a Medicin to be applied about the part: or, ℞ *Emplaſt. Diacalcith.* ℥ iv. *Ole. Roſar. & aceti, ana* ℥ ß. *liquefiant ſimul*, and let a Medicin be made for the fore-mentioned uſe. Irrigations of Oil of Roſes and Myrtils, with the white of an Egg, or a whole Egg added thereto, may ſerve for lenitives, if there be no great inflammation; Rowlers and double cloths moiſtened in Oxycrate, will be alſo convenient for the ſame purpoſe. But the force of ſuch Medicins muſt be often renewed, for when they are dried, they augment the pain. But if the pain yield not to theſe, we muſt come to narcotick Medicins, ſuch as are the Oil of Poppy, of Mandrake, a Cataplaſm of Henbane and Sorrel, adding thereto Mallows and Marſh-mallows, of which we ſpoke formerly in treating of a Phlegmon. Divers Anodynes or medicins to aſſwage pain.

Laſtly, We muſt give heed to the cauſe of the pain, to the kind and nature of the humour that flows down, and to the way which nature affects: for according to the variety of theſe things, the Medicins 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 Medicins.

CHAP. IX.

Of Convulſion by reaſon of a Wound.

A Convulſion is an unvoluntary contraction of the Muſcles (as of parts moveable at our pleaſure) towards their original, that is, the Brain and Spinal Marrow, for by this the convulſed member or the whole body (if the Convulſion be univerſal) cannot be moved at our pleaſure. Yet motion is not loſt in a Convulſion as it is in a Palſie, but it is onely 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 general. What a Convulſion is.

The firſt is called by the Greeks *Tetanos*, when as the whole body grows ſtiff like a ſtake that it cannot be moved any way. Three kinds of an univerſal 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. Three cauſes of a Convulſion.

Abundance of humours cauſe Repletion, dulling the body by immoderate eating and drinking, and omiſſion of Exerciſe, or any accuſtomed evacuation, as ſuppreſſion of the Hemorrhoids and Courſes: for hence are ſuch like excrementitious humours drawn into the Nerves, with which they being repleat and filled are dilated more than is fit, whence neceſſarily becoming more ſhort, they ſuffer Convulſion. Examples whereof appear in Leather, and Lute or Viol ſtrings, which ſwollen with moiſture in a wet ſeaſon are broken by repletion. Cauſes of Repletion.

Immoderate Vomitings, Fluxes, or Bleedings, cauſe Inanition or Emptineſs; wherefore a Convulſion cauſed by a Wound, is deadly: as alſo by burning Fevers. For by theſe and the like cauſes, the inbred and primogenious humidity of the Nerves is waſted, ſo that they are contracted like Leather which is ſhrunk up, by being held too near the fire, or as Fiddle-ſtrings which dried with Summers heat, are broken with violence; ſuch a Convulſion is incurable: For it is better a Fever follow a Convulſion, than a Convulſion a Fever; as we are taught by *Hippocrates*, ſo that ſuch a Fever be proportional to the ſtrength of the convulſifick cauſe, and the Convulſion proceed from Repletion; for the abundant and groſs humour cauſing the Convulſion is digetted and waſted by the feveriſh heat. Cauſes of Inanition. *Aph. 26. ſec. 2.*

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 and piercing cold, which is hurtful 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 original, 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 all the Nerves and Muſcles; as we ſee it happeneth in thoſe which have the Falling-Sickneſs. By which it appears that not onely the Brain it ſelf ſuffereth together with the Nerves, but alſo the Nerves with the Brain. The ſigns of a Convulſion are, difficult, painful, and depraved motions, Cauſes of Convulſion by conſent of pain. Signs of a convulſion.

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 universal Sweat.

CHAP. X.

The cure of a Convulsion.

The cause of a Convulsion by Repletion.

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 Medicins; as by Diet conveniently appointed, by purging, bleeding, digestive local Medicins, Exercise, Frictions, Sulphureous Baths and other things appointed by the prescription of some learned Physician 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 local remedies are Oils, Unguents, and Liniments, with which the Neck, Back-bone, and all the contracted parts shall be anointed. The Oils are, the Oil of Foxes, Bays, Cammomil, Worms, Turpentine, of *Castus*, of *Castoreum*: The Ointments are, *Unguentum Arragon, Agrippæ, de Althæa, Martiatum.* This may be the form of a Liniment; ℞ *Olei chamæm. & Laurin. ana* ʒ ij. *Olei Vulp.* ʒ i. *Unguenti de Althæa & Marti. an.* ʒ β. *Axungiæ Vulpis,* ʒ i. *Aquæ vitæ* ʒ i. ʃ. *Ceræ quantum sufficit.* Make a Liniment for your use. Or, ℞ *Olei Lumbric. de Spica & de Castoreo an.* ʒ iij. *Axung. hum.* ʒ i. *Sulphuris vivi,* ʒ β. *Ceræ quantum sufficit.* Make a Liniment. Or, ℞ *Unguenti Martiati, & Agrip. an.* ʒ iij. *Olei de Terebinth.* ʒ i. β. *Olei Salviæ,* ʒ β. *Aquæ vitæ* ʒ i. *Ceræ* ʒ i. ʃ. *fiat linimentum.* But this disease is cured by slender Diet, and Sweating, with the Decoctions of *Guaiacum*, 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 wholsomly and moderately nourish. And therefore you must prescribe a Diet consisting of Meats full of good nourishment, as Broths, and Cullices of Capons, Pigeons, Veal, and Mutton, boiling 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 Broth will be profitable, ℞ *Lactucæ, Buglos. & portul. an. M.* i. *quatuor seminum frigid. major. an.* ʒ β. *seminis Barberis,* ʒ i. Let them all be boiled with a Chicken, and let him take the Broth every morning. If thirst oppress him, the following Julep will be good. ℞ *Aquæ rosar.* ʒ iv. *aquæ viol.* ℔ ʃ. *saccari albissimi* ʒ vi. *fiat Julep, utatur in sit.* 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 Oil and Milk. Topick remedies shall be Liniments and Baths. Let this be the example of a Liniment, ℞ *Olei Viol. & Amygdal. dulc. an.* ʒ ij. *Olei Lilior. & Lumbric. an.* ʒ i. *Axungiæ porci recentis,* ʒ 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. ℞ *Fol. Malvæ, Bismalvæ, Pariet. ana M.* vj. *Seminis Lini & fænug. an.* ℔ ʃ. *coquantur in aqua communi, addendo Olei Lilior.* ℔ ix. 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 warm cloths, 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 Oil alone, or of them equally mixt together.

An Emollient Liniment for any Convulsion.

An Emollient and humecting Bath.

CHAP. XI.

Of the Cure of a Convulsion by sympathy and pain.

The Cure of a Convulsion by a puncture or bite.

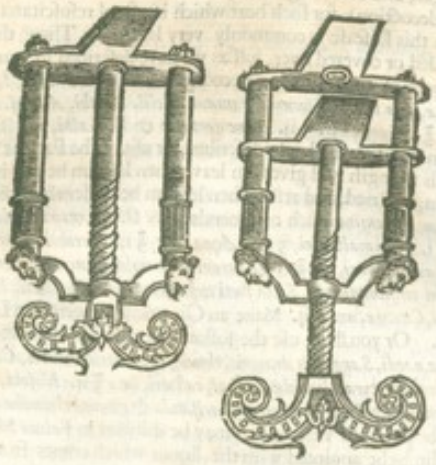
A Convulsion which is caused both by consent of pain and communication of the affect, is cured by remedies which are contrary to the dolorifick cause. For thus if it proceed from a puncture or venemous bite, the wound must be dilated and enlarged by cutting the skin, that so the venenate matter may flow forth more freely, for which purpose also Medicins which are of a thin and liquid consistence, but of a drying and digestive faculty shall be poured in, to call forth and dissove the virulency, as Treacle and Mithridate dissolved in *Aqua vitæ*, with a little of some Mercurial 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 the 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 Oil of Turpentine, of *Euphorbium*, mixt with *Aqu. vitæ*, and also with other remedies appropriated to punctures of the nerves. If the pain proceed from excess of cold, because cold is hurtful to the brain, the spinal marrow, and nerves; the Patient shall be placed in a hot air, such as that of a Hot-house or Stove; 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 sign 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 up 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 following figures demonstrate; the one presenting it open and somewhat twined up, and the other as it is shut.

A worthy *Alexipharmacum* or Antidote.

You must hinder the locking of the teeth.

The

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 Navel and the Head, otherwhiles the lower which are from the Navel to the Feet; sometimes the Tongue, Gullet, Bladder, Yard, Eyes; and lastly, any of the particles of the body. What a Palsie is. The differences thereof.

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. How it differs from a Convulsion.

The causes are internal or external; the internal are humours obstructing one of the Ventricles of the Brain, or one side of the spinal marrow, so that the animal faculty, the worker of Sense and Motion, cannot by the nerves come to the part to perform its action. The external causes are a fall, blow, and the like injuries, by which oft-times the joints are dislocated, the spinal marrow wrested aside, and constrictions and compressions of the *Vertebræ* arise, which are causes that the animal spirit cannot come to the Organs in its whole substance. But it is easie 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 spinal marrow; but if the parts of the head be untoucht, either of the sides being wholly resolved, the fault remains in the original of the spinal marrow; if the arms 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 always have recourse to the original 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 animal spirit. Old men scarce or never recover of the Palsie, because their native heat is languid, and they are oppressed with abundance of excrementitious humours; neither doth an inveterate Palsie which hath long possest the part, neither that which succeeds an Apoplexy, yield us any better hope of cure. It is good for a Fever to come upon a Palsie, for it makes the dissipation of the resolving and relaxing humour, to be hoped for. When the member affected with the Palsie is much wasted, and the opposite, on the contrary, much increased in quantity, heat, and colour, it is ill: for this is a sign of the extreme 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. The causes. It is good for a Fever to happen upon a Palsie.

CHAP. XIII.

Of the Cure of the Palsie.

IN the cure of the Palsie we must not attempt any thing, unless we have first used general remedies, Diet and Purging; all which care lieth upon the learned and prudent Physician. The Decoction of *Guaiacum* is very fit for this purpose, for it procures sweat and attenuates, digests and drieth up all the humidity with relaxeth the nerves: but when sweat doth not flow, it shall not be The decoction of *Guaiacum* is good for a Palsie.

Things actually hot good for to be applied to paralytick members.

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 actual resuscitateth and strengtheneth 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. ℞ *Fol. Salviæ, Lavend. Lauri major. Absinth. Thym. Angelicæ, Rutæ, ana M.* ß. *Florum Chamæm. Melil. Anethi, Anthos. ana P.* ij. *Baccar. Laur. & Juniper. Conquassatur. ana* ʒ i. *Caryophyl.* ʒ ij. *Aquæ fontanæ & Vini albi, ana* lb iv. Let them be all put in the Vessel mentioned in the Treatise lately described for use. The Patient shall keep himself in that Bathing-tub, as long as his strength will give him leave, then let him be put into his bed well covered, where he shall sweat again, be dried, and rest. Then let him be presently anointed with the following Ointment, which *Leonellus Faventinus* much commends: ℞ *Olei Laurini & de Terebinth. ana* ʒ iij. *Olei Nardini & petrolei, ana* ℥ i. *Vini malvatici,* ʒ iv. *Aquæ vitæ* ʒ ij. *Pyrethri, Piperis, Sinap. Granor. Junip. Gummi hederæ, anacard. Laudani puri, an.* ʒ i. ß. *Terantur & misceantur omnia cum Oleis & Vino: bulliant in vase duplici usque ad Vini consumptionem, fiatque forti expressione, adde Galbani, Bdellii, Euphorbii, Myrrhæ, Castorei, adipis Ursi, Anatis, Cicutæ, ana* ℥ 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 Physicians: ℞ *Myrrhæ & Aloes, Spicæ nardi, Sanguinis draconis, thuris, opoponacis, Bdellii, Carpobalsami, amomi, sarcocollæ, croci, mastic. gummi arabici, styrac. liquidæ, Ladani, castorei, ana* ℥ ij. *Moschi,* ʒ i. *Aquæ vitæ,* ℥ i. *Terebinthinæ veteræ, ad pondus omnium, pulverisabuntur pulverisanda & gummi eliquabuntur cum aquæ 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 Medicin: ℞ *Rad. Angel. Iridis floren. gentian. cyperi, ana* ℥ i. *Calami aromat. Cinam. Caryophyl. nucis Moschi. macis, ana* ʒ ij. *Salviæ major. Iuæ arthriticæ, Lavend. rorism. satureiæ, puleg. calament. mentastri, ana M.* ß. *florum. chamæm. melil. hyperic. anthos, stæchad. ana P.* i. *Concisa omnia contundantur, & in Aquæ vit. & Vini malvat. an.* lb ij. *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 spoonful to drink in the morning with some Sugar. For thus the Stomach will be heated, and much phlegm contained therein as the fewel of this disease, will be consumed.

Leo Faventius his Ointment.

An approved Ointment for the Palsie.

A distilled Water, good to wash them outwardly, and to drink inwardly.

Exercises and frictions. Chymical Oil.

You must also appoint Exercises of the affected parts, and frequent and hard frictions, with hot linen cloths, that the native heat may be recalled, and the excrements contained in the parts digested: you may also use the Chymical Oyls of Rosemary, Thyme, Lavender, Cloves, Nutmegs; and lastly, of all Spices, the manner of extracting whereof, we shall hereafter declare in a peculiar Treatise.

CHAP. XIV.

Of Swooning.

What Swooning is. Three causes of Swooning.

SWooning is a sudden and pertinacious defect of all the powers, but especially the vital; in this, the Patients lie without motion or sense, so that the Ancients thought that it differed from Death onely in continuance of time. The cause of Swooning, which happens to those that are Wounded, is Bleeding, which causeth a dissipation of the spirits: or Fear, which causeth a sudden and joint retirement of the spirits to the heart. Whence follows an intermission of the proper duty, as also of of the rest of the faculties, whilest they being thus troubled, are at a stand. Also Swooning 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 Swooning 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 poisonous Wounds. The signs of Swooning are paleness, a dewy and sudden sweat arising, the failing of the pulse, a sudden 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 Swoon die, unless they have present help.

The cure of Swooning caused by dissipation of spirits. The cure of Swooning caused by a venenate air. The cure of Swooning caused by oppression and obstruction.

Therefore you shall help them, if when they are ready to fall, you sprinkle much cold water in their face, if that the swooning happen by dissipation of the spirits; or if they shall 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 poisonous 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 Spacel. But if the Patients cannot be raised out of their Swoons, 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, call forth, and resuscitate the spirits, such as are, strong Wines to drink, sweet Perfumes to smell: You must call them by their own name loud in their ear, 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 *Aqua vitæ*, wherein Cloves, Nutmegs, and Ginger have been steeped.

CHAP. XV.

Of Delirium (i. e.) *Raving, Talking idly, or Doting.*

DOting or Talking idly, here is used for a symptom which commonly happeneth in Fevers caused by a wound, and inflammation; and it is a perturbation of the fantie and function of the mind, not long induring. Wherefore such a doting happens upon Wounds by reason of vehement pain, and a fever, when as the nervous parts, as the joints, stomach, and midriff, shall be violated. What a symptomatical *Delirium* is. The causes thereof.

For the Ancients did therefore call the Midriff *Phrena*, because when this was hurt, as if the mind it self were hurt, a certain phrenzie ensues; that is, a perturbation of the animal 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 bleeding, which causeth a dissipation of the spirits, whereby it happens that the motions and thoughts of the mind err, 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 sudden tumult and fear. Lastly, What things soever with any distemper, especially hot, do hurt and debilitate the mind These may cause Doting by the afflux of humours, 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 Bloud-letting by the prescription of a Physician, the hair being shaved or cut off, the head shall be fomented with Rose Vinegar, and then an Emplaister of *Diacalcitheos*, dissolved in Oil 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, Sorrel, and such like. Cold things shall be applied to his Nostrils, 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 cogitations 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 those things which have been set down in the Chapter of Swooning. Why the Brain suffers with the Midriff. The Cure.

The End of the Ninth Book.

BOOK X.

Of the Green and Bloudy WOUNDS *of each Part.*

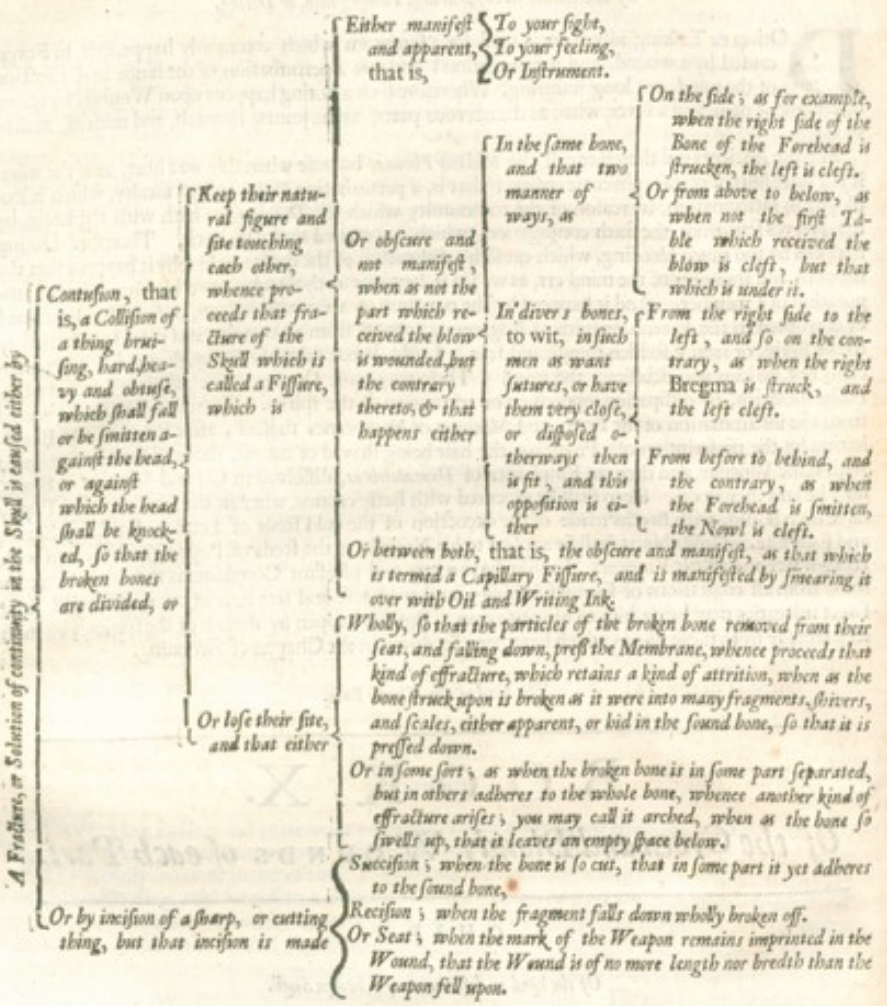
CHAP. I.

Of the kind or differences of a broken Skull.

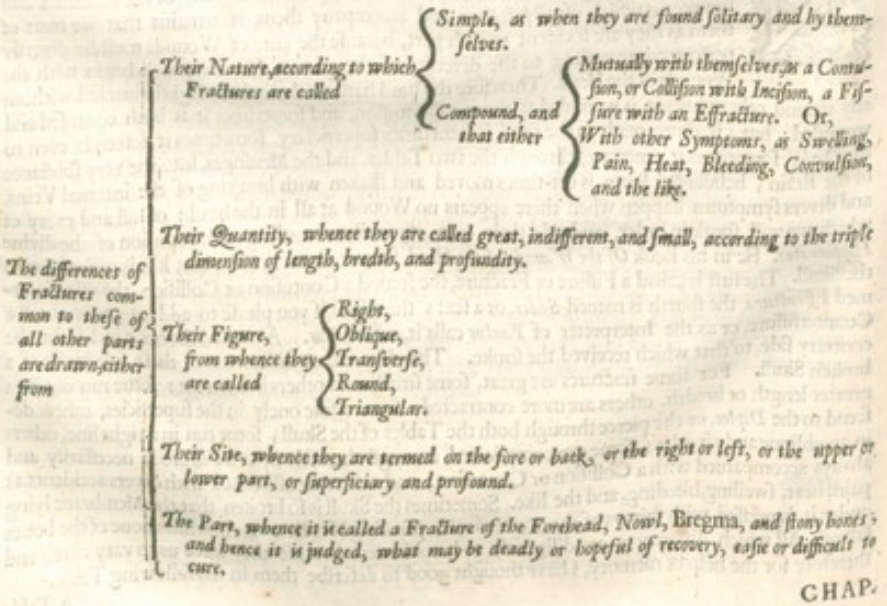
NOw that we have briefly treated of Wounds in general, that is, of their differences, signs, causes, prognosticks and cure, and also shewed the reason, of the accidents and symptoms which usually follow and accompany them, it remains that we treat of them as they are incident to each part, because the 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 slightly 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 two Tables, and the Meninges, into the very substance of the Brain; besides the Brain is oft-times moved and shaken with breaking of the internal 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 second a Contusion or Collision, the third is termed *Effracture*, the fourth is named *Sedes*, or a seat; the fifth (if you please to add it) you may call a Counterfissure, or as the Interpreter of *Paulus* calls it, a *Resonatus*. As when the boue is cleft on the contrary side, to that which received the stroke. There are many differences of these five kinds of a broken Skull. 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 onely 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 always 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 Boue, as with pricking Needles. Somewhiles none of the bones fall off. All which differences are diligently to be observed, because they force us to vary 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 Table

A Table of the Fractures of the Skull.



Another Table of the differences of a fractured Skull.



CHAP.

CHAP. II.

Of the causes and signs of a broken Skull.

THe causes of a broken Skull are external, 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. The external causes.
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 Eye and Hand.

The Rational 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 shall fall headlong from a high place upon some hard thing. If for some time 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 we must consider whether the Patient received the blow with his Head unarmed and naked; whether he fell into a Swoon presently after the blow; whether when he came to himself, he was in his right senses; whether his eyes were blinded; whether he were troubled with a giddiness or dizinesse, and whether he bled at the nose, mouth, ears, or eyes; and lastly, whether he vomited. For *Hippocrates* writes, that those who have their Brain cut, must necessarily have a Fever 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. Rational causes. *Aphor.* 50. *sect.* 6.

Also a dull sound as from a broken Vessel 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 Skull 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 seldom. 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 thred, 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 overcome and forced by this sense of pain, will by lifting up of his hand make demonstration thereof. As yet I have not been able to find the truth hereof by experience, although I have made trial of it in many. Wherefore I cannot say any thing certainly of this sign, as neither of that which is mentioned by *Hippocrates* in *Coris Pref.* In such as you doubt whether the bones of the Skull be broken or not, you must judge by giving them the stalk of the Asphodil 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 those which are broken seem to make a noise. *Lib.* 8. *cap* 4. *Hippocrates* and *Guido's* conjectural signs of a broken skull.

But passing over these things, now let us come to those signs which may be obvious to our senses.

CHAP. III.

Of the signs of a broken Skull, which are manifest to our sense.

THose 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 yields 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 near the Wound shall perceive the bone either to stand up, or be prest down otherwise than it should naturally be.

The skin being cut cross-wise, and the bone laid bare, if the fracture be not obvious to the eye, you must trie with your Probe, which must neither be too thin nor too sharp, lest by falling into some natural 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 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 suture, 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 always one and their natural site, as also it often comes to pass that the broken clift, or cut bone, can neither be perceived by your sight nor instrument: wherefore if you think there is any such thing, by the rational signs above mentioned; anoint the place with Writing Ink and Oil, 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 Medicins speedily. Verily when a fracture chances to light upon any suture, the

Lib. 5. Epid. In Autonomus of Omilus, Hippocrates was deceived by the futures.

the diſeaſe is hard to be known, unleſs the fracture be very great, becauſe the futures by their cliſts 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 ſeveral kinds thereof, with a Fiſſure.

CHAP. IV.

Of a Fiſſure, being the firſt kind of a broken Skull.

Upon what occaſion the hairy ſcalp muſt be cut.

IF the Chirurgeon by the fore-mentioned 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 Razor or Inciſion-knife, the muſculous Skin with the *Pericranium* lying under it in a triangular or quadrangular figure to a proportionable bigneſs, always ſhunning as much as in him lies, the futures and temples; neither muſt he fear any harm to enſue hereof; for it is far better to bare the Bone by cutting the Skin, than to ſuffer the kind and 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.

Celſus.

Hippocrates.

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 Razor 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.

A Razor, 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 ſharp Razor 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 Chiſſel whoſe figure you ſee here expreſſed.

A Chiſſel or Inſtrument to pull back or ſeparate the Pericranium *from the Skull.*

Then you muſt fill all the Wound with Bolſters of fine ſoft lint, that ſo the lips may be kept further aſunder. But you ſhall apply upon it Medicins fit to ſtanch bloud. But if it ſo come to paſs that the bloud flows forth ſo violently, that it can be ſtaid by no means, the Veſſel it ſelf muſt be bound, after this manner.

The manner to bind a Veſſel in caſe of too much bleeding. A Hiſtory.

Firſt thruſt through the muſculous skin on the outſide with a needle and thred, then thruſt the needle back again, then tie the thred on a knot on the out-ſide, 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, leſt the ſtrait twitching 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.

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 hinder part of the *Bregma*, for which cauſe it was nt to open the muſculous skin, with a croſs Inciſion, both that the congealed bloud 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 bloud 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 ſcarce ſpeak: I being called, ſhewed them by experience, that whereas aſtringent Medicins were uſed before to no purpoſe, it was better to ſtay the bleeding by binding the Veſſel, than to let the Patient die 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 rational ſigns may cauſe one to have a conjecture that there is a fracture: Then you muſt anoint, as we told you before, the bared bone with Writing Ink, and a little Oil of Roſes, that the cleft or crack may be died 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 Oil 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 until no ſign of the Fiſſure remain, or elſe until 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

A ſign that both the Tables are broken.

ſtopping

ſtopping his Noſe and Mouth he ſtrive to breath with a great indeavour. For then bloudy 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 a *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 bloud and *ſanies* may paſs and be drawn forth, leſt that matter being ſuppreſt, may corrupt the bone, and cauſe an inflammation in the Brain. But the broken Bone muſt be taken forth within three days, 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 doubtful remedy than none. Yet the By-ſtanders ſhall be admoniſhed and told of the danger, for many more die, who have not the broken bones of the Skull taken out, than thoſe that have.

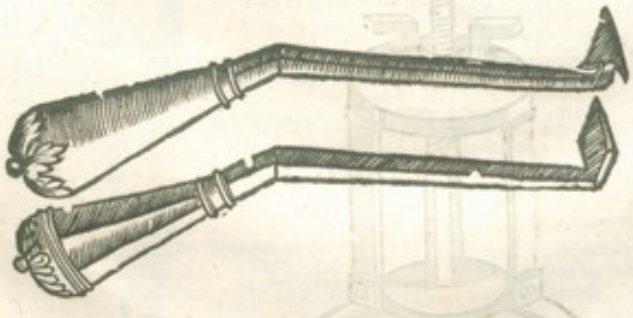
A ſign that both the Tables are broken.

You may uſe the Trepan after the tenth day.

But 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 ſcrued into one handle, the figure whereof I have exhibited.

Radulæ *or* Scalpri, (i.) *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 cliſt, 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 ſhall be broken and ſhivered into many pieces, 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* onely 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 bloud, 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 bloud may be evacuated and emptied. For in this caſe you muſt wholly deſiſt from ſuppurative Medicins (which otherwiſe would be of good uſe in a fleſhy part) by reaſon that all the moiſt things are hurtful to the Bones, as ſhall be ſhewn hereafter.

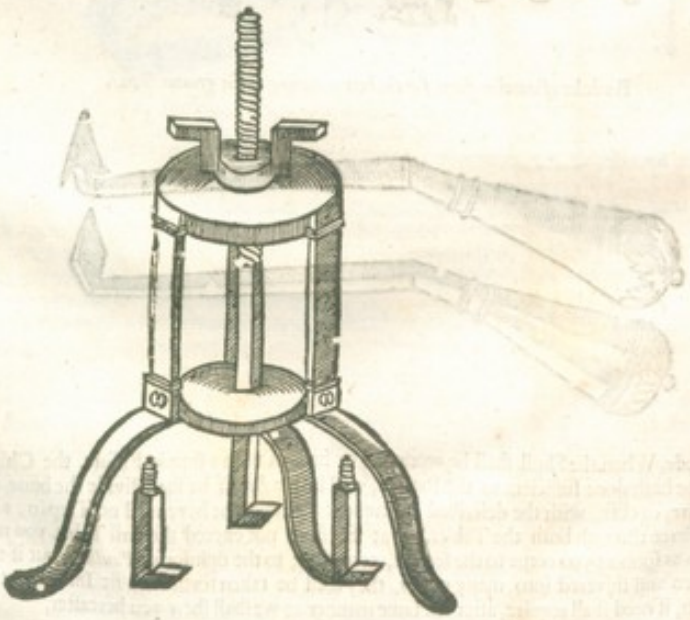
How a Contuſion of the Skull muſt be cured.

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 bloud hath iſſued. The reſidue of the Cure is perfected by moderate compreſſion of the part, and drying Medicins. Moreover the Skull 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, and 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 cloſe ſhut; for thus there will be hope to reſtore the depreſſed Bone to its place, by the ſpirits forced upwards to the Brain and Skull, by the powerful 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 depreſt 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.

Different cures of a depreſſed Skull.

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 natural ſite; for this ſame Inſtrument is of ſtrength ſufficient for that purpoſe. It is made with three feet, that ſo it may be applied 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.

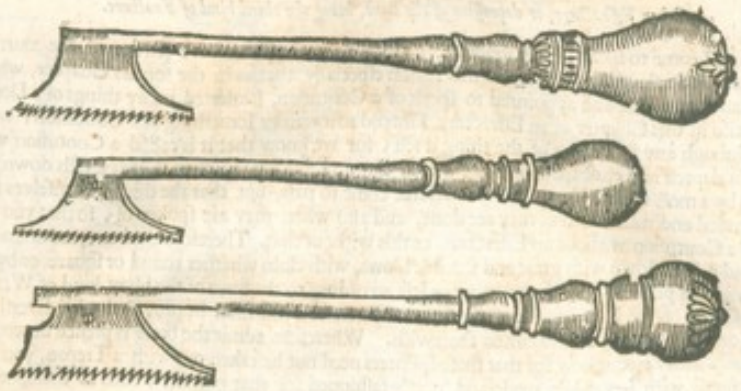
A three-footed Levatory.



But if at any time it comes to paſs that the Bone is not totally broken or depreſt, but onely 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 Skull with little Saws like theſe which you ſee here expreſſed; for thus ſo much of the bone as ſhall be thought needful, may be cut off without compreſſion, neither will there be any danger of hurting the Braſnor Membrane with the broken bone.

The

The figures of Saws fit to divide the Skull.



But if by such signs as are present, and shall appear, we perceive or judge that the contusion goes but to the second Table, or scarce so far, the baring or taking away of the bone must go no farther than the contusion reaches, for that will be sufficient to eschew and divert inflammations and divers other symptoms. 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.

AA. *Shews the point or tongue of the Levatory, which must be somewhat dull, that so it may be the more gently and easily put between 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, or depreſſion of the Bone, being the third kind of Fracture.

What a Contuſion is.

What an Effracture is.

The cauſe of Effractures.

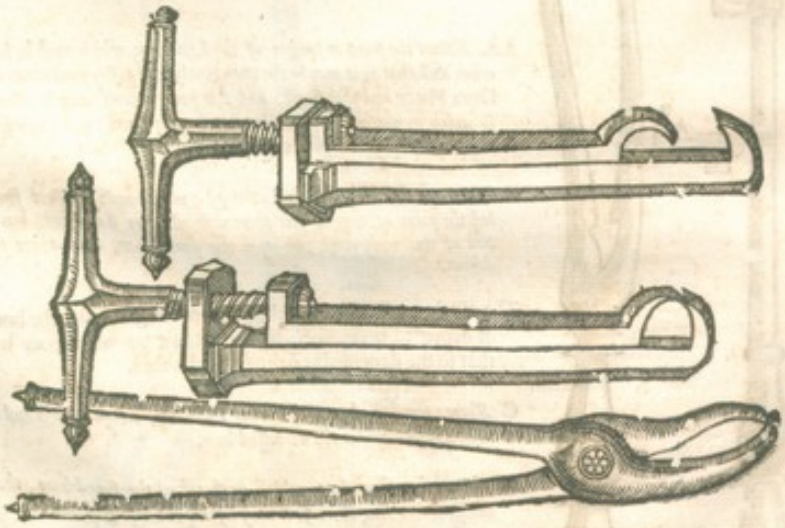
The Cure.

BEfore I come to ſpeak of an Effracture, I think it not amiſs to crave pardon of the courteous 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 intermix ſomething of a Contuſion; we do not this through any ignorance of the thing it ſelf; for we 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 ſcarce 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 ſcarce 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 leſs 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 here are expreſt.

A Levatory.

But we muſt have ſpecial 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 ſhall 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 Parrots Beaks.*



Moreover I have thought good here to give you the Figures of Chiſels, Scrapers, Pincers, together with a leaden Mallet, becauſe ſuch Inſtruments are not onely very neceſſary to take forth the ſcales of bones which are broken, but alſo to plain and ſmooth thoſe which remain whole.

The

The Figures of Scrapers, Pincers, a leaden Mallet, &c.

But here you must note, that a Trepan or Levatory, must never be applied to a bone quite broken, left the membranes lying under it be hurt by the compression thereof. Therefore you must apply them to a sound bone, but as near as you can to the Fracture, so that you take away as little of the Skull as is possible, left 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, and 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 Skull, as it also doth those of 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 bloudy matter, that with this as with marrow it might repair the loss and defect of the bone.

Hipp. lib. de vuln. cap. Gal. lib. 6. meth. cap. ult.

The truth hereof was lately manifested in the servant of Master *Grolo*, who had an Effracture on the coronal 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 fearful production of an Effracture, by the moveableness of the bone shaking under my hand, for it reached from the midst of the Fore-head 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 onely raise up the bone which was depress, 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 adjoining to the Fracture. A History.

CHAP. VII.

Of a Seat, being the fourth kind of a broken Skull.

Hippocrates calls a Seat that kind of Fracture of the Skull, when the Weapon so falls upon the Skull, that the Fracture retaining the print thereof, is neither stretched forth any further, nor contracted to any less 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 ways, or else be but short, or otherwise are dilated to some bredth or else be but narrow; whether they shall be done with a cut, or with a prick with a Dagger, Stylet-to, 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 and great wound, that a portion of the bone is wholly so cut off that it is clean severed from the rest of the Skull, and hang onely by the *Pericranium* and the 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 tried the truth of this experiment in Captain *Hydron*, not very long ago. 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 scarce adhering to the *Pericranium* and musculous skin 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 bloud 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 mercy 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 Skull 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.*

What a *Resonitus* is.

SOmetimes the Fracture is made in the part oppofite to that which received the blow; as if the right fide 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 die of ſuch a Fracture, the Chirurgeon muſt be pardoned.

Lib.6.cap.90. 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.

In whom this fracture may take place in divers bones of the skull.

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 expreſs 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 grown together of many; This ſhall be made manifeſt by recital of the following Hiſtory.

A Hiſtory.

A ſervant of *Maſſius* the Poſt-maſter, had a grievous blow with a ſtone upon the right *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 harm, and alſo that the congealed bloud might be preſſed forth, the wound was dilated, the skin being open by *Theodore Hercus* the Chirurgeon, who as he was a skilful 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 ſigns of a fractured skull; ſo it happened that he died on the one and twentieth day of his ſickneſs. But I being called to learn, and ſearch how he came by his death, dividing the skull with a Saw, found in the part oppoſite to the blow, a great quantity of *ſanies*, or bloudy 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 ſcarce apparent.

The *Reſonitus* may be in the ſame bone of the skull.

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 ſkulls 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 ways. 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 Lambdal ſuture be ſmitten, and the other part next to the Coronal ſuture be cloven. Secondly, When as not the ſame ſuperficies and table which receives the blow, but that which lies under it is cleft, which kind of fracture

A Hiſtory.

I obſerved in a certain Gentleman, a Horſeman of Captain *Stompans* Troop; He in defending the breach of the Wall of the Caſtle of *Hiſdin*, was ſtruck with a Muſquet 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 skull, for as much as could be diſcerned, yet notwithſtanding he died apoplectick upon the ſixth day after.

But I being very deſirous to know what might be the true cauſe of his death, dividing his skull, 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 Phyſicians, in the expedition of *Roan*.

Why *Hippocrates* ſet down no way to cure a *Reſonitus*.

The manner to know when the skull is fractured by 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 knowledge and conjecture of ſuch a fracture, if it ſhall at any time happen. Wherefore having firſt diligently ſhaven away the hair, we muſt apply an Emplaiſter of Pitch, Tar, Wax, Turpentine, the Powder of *Iris*, or Flower-de-luce roots and Maſtich; now if any place of the head ſhall appear more moiſt, ſoft, and ſwollen, 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 forced to put his hand to that part of the skull. Confirmed with theſe and other ſigns formerly mentioned, let him call a Council of learned Phyſicians; and fore-tell the danger to the Patients friends which are there preſent, that there may no occaſion of calumny remain, then let him boldly perforate the skull, for that is far better than forſake the Patient ready to yield to the greatneſs of the hidden diſeaſe, and ſo conſequently to die within a ſhort while after. There are four ſorts or conditions of fractures, by which the Chirurgeon may be ſo deceived, that when the skull 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 onely capillary. The third is when the bone is ſhaken on the inſide, the utter ſurface nevertheleſs remaining whole, for-aſmuch as can be diſcerned. The fourth is, when the bone is ſtricken on the one ſide, and cleft on the other.

CHAP.

CHAP. IX.

Of the moving, or concussion of the Brain.

BEsides the mentioned kinds of Fractures by which the Brain also suffers, there is another kind of affect besides Nature, which also assails it by the violent incursion of a cause in like manner external; they call it the commotion or shaking of the Brain, whence Symptoms like those of a broken skull ensue. Falling from aloft upon a solid and hard body, dull and heavy blows, as with Stones, Clubs, Staves, the report of a piece of Ordnance, or crack of Thunder, and also a blow with ones hand. *Gal. lib. 2. de comp. medic. cap. 6. & Com. ad Aph. 58. sect. 7.*

Thus as *Hippocrates* tells, that beautiful Damosel the daughter of *Nerius*, when she was twenty years 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 giddiness, and lay without breathing, and when she came home, she fell presently into a great Fever, her head ached, and her face grew red. The seventh day after, there came forth some two or three ounces of stinking and bloudy matter about her right Ear, and she seemed somewhat better, and to be at somewhat more ease. The Fever increased 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 nineth day she died. But you must note, that though the head be armed with a Helmet, yet by the violence of a blow the Veins and Arteries may be broken, not onely these which pass through the sutures, but also those which are disperse 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 juice to the Brain wanting Marrow, that is, bloud to nourish it, as we have formerly shewed in our Anatomy. *Lib. 5. Epidem.* The Vessels of the brain broken by the commotion thereof.

But from hence proceeds the efflux of bloud running between the skull and membranes, or else between the membranes and brain; the bloud 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 sixth 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 those 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 natural 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 follows upon fractures of the Skull and concussions of the Brain. Signs. *Celsus.* 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 bloud 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 Fever. But a Fever 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 evils, a Sphacel, and corruption of the Brain ensue, together with a great difficulty of breathing, by reason of the disturbance of the animal 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 died. He having set in order the affairs of *France*, and entered into amity 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 vizour 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 Fore-head 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 died the eleventh day after the hurt. His Skull being opened after his death, there was a great deal of bloud found between the *Dura* and *Pia Mater*, poured forth in the part oppolite to the blow, at the middle of the future of the hind-part of the head; and 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 onely the wounding of the Eye, as many have falsly thought. For we have seen many others, who have not died of far 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 thickness, through the vizour of his helmet, it entering into the Orb 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 Physicians, and *James* the Kings Chirurgeon assisting me. A History.

What shall I say of that great and very memorable wound of *Francis* of *Lorain* 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 entering 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, Veins, and Arteries, and other parts; yet the generous Prince by the favour of God recovered. A History.

By which you may learn, that many die of small wounds, and other recover of great, yea, very large

Why some die of small wounds, and others recover of great.

large and desperate ones. The cause of which events is chiefly and primarily to be attributed to God, the Authour and Preserver of Mankind; but secondarily to the 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 bloud upon the membranes of the Brain, which being there concrete, may cause great pain, by reason whereof it blinds the Eyes; 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 skull.

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 those which cut or bruise but onely the hairy scalp, but certainly much less, those which are accompanied by a fracture in the Skull, for oft-times all horrid symptoms follow upon them, and consequently death it self, especially in bodies full of ill humours, or of an ill-habit, such as are these which are affected with the *Lues Venerea*, Leprosie, Dropsie, Pthysick, 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 bloud: but those which are sick of hectick Fevers and Consumptions want store of bloud, and those bodies which are replete with ill humours, and of an ill habit, have no afflux or plenty of laudable bloud: 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 sanguin 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 bloud laudable both in consistence and quality) than in old men, whose bones are drier and harder, and so resist union, which comes by mixture, and their bloud is serous, and consequently a more unfit bond of unity and agglutination; yet oft-times through occasion of the symptoms which follow upon them, that is, putrefaction and corruption, which sooner arise in a hot and moist body, and are more speedily increased 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 humours putrefie sooner in Summer, because then unnatural heat is 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 ensues. 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 Bloud-letting,

Aph. 85. sect. 5.

Purging, or the use of resolving local Medicins, as may be gathered by *Hippocrates* in his Aphorisms. If a Fever ensue presently after the beginning of a wound of the head, that is, upon the fourth or seventh day, which usually happens, you must juge it to be occasioned by by the generating of *Pus* or

Aph. 47 sect. 2.

Matter, as it is recited by *Hippocrates*. Neither is such a Fever 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 *Meninges* or Skull, 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.

Wounds which are dry, rough, livid, and black, are evil.

For as it is in *Hippocrates Aphorisf. 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 dies, 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 withall 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 Fever 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 Fever is caused by an *Erysipelas* and conflux of cholerick matter; if it keep the form of a Tertian, 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 swollen, as also all the face; if the eyes be red and fiery; if the neck and chaps be so stiff, that he can scarce 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 bloud, chiefly assails the face, and that for two causes.

The signs of a Fever caused by an *Erysipelas*.

Why an *Erysipelas* chiefly assail; the face

The

The first is, by reason of the natural levity of the cholerick humour, the other because of the rarity of the skin of these parts.

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 bloud, but we must purge him with Medicins evacuating choler. If it be an *Erysipelas Phlegmonodes*, you must draw bloud from the Cephalick Vein of that side which is most affected, always using advice of a Physician. Having used these general means, you must apply refrigerating and humecting things, such as are the Juice of Nightshade, Housleek, Purslane, Lettuce, Navel-wort, Water-Lentil, or Ducks-meat, Gounds, a Liniment made of two handfulls of Sorrel boiled in fair Water, then beaten or drawn through a search, with ointment of Roses or some *unguent. Populeon* added thereto will be very commodious. Such and the like remedies must be often and so long renewed until the unnatural heat be extinguished. But we must be careful to abstain from all unctuous and oily things, because they may easily be inflamed, and so increase the Disease. Next we must come to resolving Medicins; but it is good when any thing comes from within, to without; but on the contrary, it is ill when it runs 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 lies 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 onely 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 Sphacel, in which case they all have not onely pustules on their tongues, but some of them die stupid and mute, othersome with a Convulsion of the opposite part; neither as yet I have observed any which have died with either of these symptoms, by reason of a wound in the Head, who have not had the substance of their Brain tainted with a Sphacel, as it hath appeared when their Skulls have been opened after their death.

The cure of an *Erysipelas* on the face.

Why Oily things must not 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 humours thither by the occasion of the Wound, and by reason of the Pains drawing, and Natures violently sending help to the affected part.

A Convulsion is caused by dryness.

A two-fold cause of Convulsitick dryness.

The sound part exhausted by this means both of the spirits and humours, 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 tie and league of concord, by the production of the passages, to wit, of Nerves, Veins, and Arthries, that if one of these forsake any part, the rest presently neglect it, whereby it languisheth, and by little and little dies 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 onely 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 through 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 equal 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 it 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, daily experience convinceth as false. Wherefore we must certainly 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.

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 onely 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 Sphacel 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 Gangrenes, through the extinction of the native heat. Besides, the passages of the animal spirit must necessarily be so obstructed by the greatness of such an inflammation or phlegmon, that it cannot flow from thence to the parts of the same side lying thereunder, 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 expel that which would be troublesom to it, if it had sense; wherefore neither are the Nerves thence arising seized upon, or contracted by a Convulsion.

Opinion of *Dalechampius*.

It

It furthermore comes to pass, that because these same Nerves are deprived of the presence and comfort of the animal 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 watery humour, or so affected by some vehement distemper, that it cannot receive the animal 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 shorten 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 wrinkled up and contracted; or else it proceeds from the vellication and acrimony of some vapour, or sanious and biting humour, 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 Nerve, when as any acrid and sanious humour 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 carion-like 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 humour *Dacryodes & 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 own force, contend and labour as much as it can, for the expulsion of that which is troublesom thereto. This labouring or concussion 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 judgment determine of that proposition of *Hippocrates* and *Avicen*.

But he adds 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 seized 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 signs of a deadly wound from the depraved faculties of the mind.

From the habit of the body.

From the time that such signs appear.

NOw that we may return to our former Discourse; you may certainly fore-tell the Patient will die, when his reason and judgment being perverted, he shall talk idly, when his memory fails him, when he cannot govern his tongue, when his sight grows dark and dim, his ears deaf, when he would cast himself headlong from his Bed, or else lies therein without any motion; when he hath a continual Fever with a *Delirium*, when the Tongue breaks out in Pustules, when it is chopt and become black by reason of too much driness, when the Wound grows dry and casts forth little or no matter; when as the colour of the Wound which was formerly fresh, is now become like salted flesh yellow and pale; when the Urin and other excrements are suppress; when the Palsie, Convulsion, Apoplexy; and lastly, often swooning, with a small and unequal pulse invade him. All such signs sometimes appear presently after the wound, otherwhiles some few days 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 fore-mentioned signs appear presently in the first days; but when they do not appear till many days 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.

Celsus lib. 8. cap. 4.

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 Plaster. I believe that in that place there is an internal cavity in the Bone, full of air, which goes to the sieve-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 scarce 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 driness of the Ulcer, and consequently the healing thereof.

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 fore-head was broken and depressed.

CHAP.

CHAP. XIII.

Of salutary Signs in Wounds of the Head.

But on the contrary, these are salutary signs; when the Patient hath no Fever, 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 hindered.

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, until the hundredth day be past. Wherefore the Physician 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. *When the Patients are out of danger.*

But let the Patient diligently avoid and shun cold, for many when they have been cured of Wounds in 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 days to its perfect coagmentation and concretion. Though in very deed one cannot set down a certain number of days, 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 general and particular; wherefore beginning with the general, we will first prescribe a convenient Diet, by the moderate use of the six things not natural. *The Patient must beware of cold.*

CHAP. XIV.

Of the general cure of a broken Skull, and of the Symptoms usually happening thereupon.

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 sneezing 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 dress't, some body standing by shall hold a Chafingdish full 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 spinal Marrow; it is also hurtful to Ulcers, by suppressing their excrements, which suppress't 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 befal the fractured skull, than by admitting the air by such as are unskilful. 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, die more through default of skill in the curing, than by the greatness of the fracture. *How the air ought to be.* *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 strewing 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 until such time as the most feared and malign symptoms are past.

For a too great light dissipates the spirits, increases pain, strengthens the Fever and Symptoms. *Hippocrates* wholly forbids Wine, therefore the Patient in stead thereof must drink Barley Water, fair Water boiled and tempered with Julep of Roses, Syrup of Violets, Vinegar, and the like, Water wherein Bread crums have been steeped, Water and Sugar with a little juice of Limmons or Pomecitron added thereto, and such like, as the ability and taste of the Patient shall require. Let him continue such drinks until he be free from malign symptoms, which usually happen within fourteen days. *The discommodities of too much light.* *What his drink must be*

His meat shall be Pap, Ptisan, thinning Almond-milks; (for Almonds are said to fill the Head with vapours and cause pain) stewed Damask Prunes, Raisins, and Currants seasoned with Sugar, and a little Cinamon, (which hath a wonderful power to comfort the Stomach, and revive and exhilarate the spirits) Chickens, Pigeons, Veal, Kid, Leverets, Birds of the Fields, Pheasons, Black-birds, Turtles, Partridges, Thrushes, Larks, and such like meats of good digestion, boiled with Lettuce, Purslane, Sorrel, Borage, Bugloss, Succory, Endive, and the like, are thought very convenient in this case. If he desire at any time to feed on meats roasted, he may; onely dipping them in Verjuice, in the acid juices of Oranges, Citrons, Limmons, or Pomegranates, sometimes in one, and sometimes in another, according to his taste and ability. If any have a desire to eat fish, he must make choice of Trouts, Gudgeons, Pikes, and 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 Dridge Powder, or Anniseed, Fennel-seed, or Coriander-comfits; also Conserve of Roses, or Marmalate of Quinces to shut up the orifice of the Ventricle, lest the head should be offended with vapours arising from thence. *Almonds increase the pain of the Head.* *What fish he may eat.*

Children must eat often, but sparingly, for Children cannot fast so long as those which are elder, because their natural heat is more strong, wherefore they stand in need of more nourishment: so also in Winter all sorts of People require more plentiful nourishment, for that then their stomachs are more hot than in Summer. *Aphor. 13. & 14. sect. 2.*

When

Aphor. 15. *sect.* 2. When the fourteenth day is past, if neither a Fever, nor any thing else forbids, he may drink Wine moderately, and by little and little increase his diet, but that respectively to each ones nature, strength, and custom. He shall shun, as much as in him lies, sleep on the day time, unless it happen that a *Phlegmon* seize upon the Brain or the *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, bloud 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 bloud 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 bloud by the force of the Sun casting his beams upon the Earth at his rising is carried into the habit of the body, it should again be more and more diffused by the strength and motion of watching, the inflammation in the Brain and *Meninges* would be much increased. Wherefore it will be better, especially then to stay by sleep the violence of the bloud 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 heavinesse of the head, and makes the wounds dry and malign.

Why sleep upon the day time is good for the brain being inflamed. *Lib.* 2. *Epidem.*

The discommodities ensuing 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 *Unguentum populeon*, or *Unguentum Rosatum* with a little Rose-Vinegar or Oxycrate; let a Sponge moistned in the decoction of white or black Poppy-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 Barley-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 four hours after meat, to procure sleep. For sleep doth much help concoction, it repairs the efflux of the triple substance caused by Watching, assuageth 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 natural rest.

Medicins procuring sleep.

The commodities of sleep.

If the Patient shall be Plethorick, let the plenitude be lessened by bloud-letting, purging and a slender diet, according to the discretion of the Physician who shall over-see the Cure. But we must take heed of strong purgations in these kinds of Wounds, especially at the beginning, lest the Fever, Inflammation, Pain, and other such like symptoms be increased by stirring up the humours.

Lib. 4. *Meth.* Phlebotomy, according to *Galens* opinion, must not onely be made respectively to the plenty of bloud, but also agreeable to the greatness of the present disease, or that which is to come, to divert and draw back that humour 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 be 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 straitness of the fibers, than to draw bloud on the oppoite side; in performance whereof you must have diligent care of the strength of the Patient, still feeling his pulse, unless the Physician be present, to whose judgment you must then commit all that business. 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 fore-head begins to sweat a little, when he feels a pain at his heart, when he is taken with a desire to vomit or to go to stool, or with yawning, and when he shall change his colour and his lips look pale, then you must stop the bloud as speedily as you can, otherwise there will be danger lest he pour forth his life together with his bloud. Then he must be refreshed with bread steeped in Wine, and put into his mouth, and by rubbing his temples and nostrils 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 humour by gently scarifying the lips of the wound, or applying of Leeches. But it shall be diverted by opening those Veins which are nigheſt to the wounded part, as the *Vena Puppis*, or that in the midst of the fore-head, or of the temples, or those which are under the tongue; besides also Cupping-glasses shall be applyed to the shoulder, sometimes with scarification, sometimes without; neither must strong and long frictions with coarse cloths of all the 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 lies still and wants both the use and benefit of accustomed exercise, are much increased.

Lib. de cur. per sanguin. miss.

The use of Frictions.

But it shall be made manifest by this following and notable example, how powerful Bloud-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 years old, who lodged there in the house of *John Martial* at the Sign of St. *Michael*. This young man was one of the houshold-servants of Mr. *Doucador*, the Steward of the Lady *Admiral* of *Brion*. He fell down head-long 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 Fever took him on the seventh day with a continual *Delirium* and inflammation of phlegmonous tumour 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 bignesse, that his visage was so much altered, that his friends knew him not, neither could he speak, hear, or swallow any thing but what was very liquid. Which I observing, although I knew that the day past, which was the eighth day of his Disease, he had four Sawcers of bloud taken from him by *Germain Agace* Barber-surgeon of the

A History.

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 Sawcers at that one time; when I came to him the day after, and ſaw that neither the Fever nor any of the fore-mentioned ſymptoms were any whit remitted, or aſſwaged, I forthwith took from him four Saucers more, which in all made two and twenty; the day following when I had obſerved that the ſymptoms were no whit leſſened, I durſt not preſume, by my own onely advice, to let him the fourth time bloud, as I deſired. Wherefore I brought unto him that moſt famous Phyſician Doctor *Valeus*, 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 and tumor which offered it ſelf to his ſight, he bid me preſently take out my Lancet and open a Vein. But I lingered on ſet purpoſe, and told him that he had already twenty two Saucers of bloud 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 chief Indications of bloud-letting yet remain, that is, the greatneſs of the Diſeaſe, and the conſtant ſtrength of the Patient. I being glad of this, took three Saucers more of bloud, he ſtanding by, and was ready to take more, but that he wiſhed me to defer until the afternoon; wherefore returning after dinner I filled two Saucers more, ſo that in all, this young man to his great benefit, loſt twenty ſeven Saucers of bloud at five times, within the ſpace of 4 days. Now the enſuing night was very pleaſing to him, the Fever left him about noon, the tumor grew much leſs, the heat of the inflammation was aſſwaged in all parts, except in his eye-lids, 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 fear which many have to draw bloud 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.

The two chief Indications in bloud letting.

Now to return from whence we digreſſed, you muſt note that nothing is ſo hurtful 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 flows from the Brain; hence therefore all the faculties, but chiefly the Animal, 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-ways through which they uſe to drive Coaches; for noiſe increaſes pain, cauſes a Fever, and brings many other ſymptoms.

The diſcommodity of Venery in wounds of the head.

How hurtful noiſe 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 Canon, 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 angered herewith, that they bled much, and by their pain and Fevers increaſed, were forced with much ſighing to breathe their laſt. Thus much may ſerve to be ſpoken of the cure in general: now we will out of the monuments of Ancients, treat of the particular.

A Hiſtory.

CHAP. XV.

Of the particular cure of wounds of the head, and of the muſculous Skin.

Of a ſimple wound of the fleſh and the skin.

LEt us begin with a ſimple wound, for whoſe cure the Chirurgeon muſt propoſe one onely ſcope, to wit, Union; for unleſs 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 ways as it is complicate, ſo many Indications ſhew themſelves. In theſe, the chiefeſt care muſt be had of the more urgent order and cauſe.

Therefore if the wound ſhall be ſimple and ſuperficiary, then the hair muſt firſt be ſhaven away, then a Plaiſter applied made of the white of an Egg, Bole Armenic, and Aloes. The following day you muſt apply *Emplaſtrum de Janua*, or elſe *de gratia Dei*, until 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 Medicin (as they call it) which may be made of Venice Turpentine, the yolks of Eggs, Oil of Roſes, and a little Saffron, and that ſhall be uſed ſo long, until the wound come to maturation; for then you muſt add Honey of Roſes and Barley flour to the digeſtive. Hence muſt we paſs to theſe Medicins, into whoſe compoſition no oily or unctuous body 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 Medicin.

A ſarcotick Medicin.

An Epulotick.

Whileſt I was at *Hiſdin*, a certain Souldier, by falling of the Earth whileſt 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 fore-head, that it hung over his face. I went about the cure in this manner; I firſt waſhed all the Wound with Wine a little warmed, that ſo I might waſh away the congealed bloud mixed with the Earth, then I dried 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*, Maſtich and Aloes; then I reſtored the hanging skin to its former place, and there ſtaid it with ſome ſtitches, being neither too ſtrait, nor too cloſe together, for fear of pain and inflammation, (which two chiefly happen whileſt the Wound comes to ſuppuration) but onely as much as ſhould

A Hiſtory.

What things we muſt obſerve in ſewing.

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 applied this following Cataplaſm to all the head. ℞ *Farinæ hord. & fabarum an.* ʒ vj. *olei roſati* ʒ iij. *aceti quantum ſufficit, fiat cataplaſma ad formam poltis*; this hath a faculty to dry, cool, repel, mitigate pain and inflammation, and ſtay bleeding.

When we muſt not let bloud in wounds. A Hiſtory.

I did not let him bloud, becauſe he had bled much, eſpecially at certain Arteries which were broken near 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 Lions, 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 tied, and leaping amongſt the Company, he with his paws threw to the ground a Girl of ſome twelve years old, and taking her head in his mouth, with his teeth wounded the muſculous skin in many places, yet hurt not the skull. She ſcarce at length delivered by the Maſter of the Lions from the jaws of Death and the Lion, was committed to the cure of *Rowland Claret* Chirurgeon, who was there preſent by chance at the ſame time: ſome few days after I was called to viſit her; ſhe was in a Fever, her head, ſhoulders, breſt, and all the places where the Lion had ſet his teeth or nails, were ſwollen; 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 ſcarce indure the ſmell thereof: ſhe was alſo oppreſt 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 poiſon. Wherefore there muſt principally great care be had of the venenate impreſſion left in the Wounds by the nails and teeth, and therefore ſuch things muſt be applied, as have power to overcome poiſon. Wherefore I ſcarified the lips of the Wounds in divers places, and applied Leeches to ſuck out the venenate bloud, and eaſe the inflammation of the parts; then I made a Lotion of *Ægyptiacum* Treacle and Mithridate, after the following manner.

The bitings of Man and Beaſts are venenate.

Theriacal topick Medicins.

℞ *Mithrid.* ʒ i. *theriac.* ʒ ij. *ægyptiac.* ʒ 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 Medicins which were either applied, or put into the Wound; and alſo of the ſame with the Conſerves of Roſes and Bugloſs diſſolved in the Water of Sorrel and *Carduus benedictus*, potions were made to ſtrengthen the heart, and vindicate it from malign vapours.

A Cordial Epithema.

For which purpoſe alſo this following *Epithema* was applied to the region of her heart. ℞ *Aquæ roſar. & nenuphar. an.* ʒ iv. *aceti ſcillitici* ʒ i. *coralliorum, ſantalorum alborum & rubrorum, roſar. rub. pulveris, ſpodii. an.* ʒ i. *Mithridatii, Theriacæ, an.* ʒ ij. *flo. cordial. pulveriſatorum* ℔. ij. *croci* ʒ i. diſſolve them all together, make an Epitheme and apply it to the heart with a ſcarlet cloth or ſponge, and let it be often renued. Verily, ſhe dreſt after this manner, and the former remedies but once uſed, pain, inflammation, and all the malign ſymptoms were much leſſened; to conclude, ſhe 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 Medicin.

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 always done, (that ſo the affect may better appear, and the remedies which are applied may take more effect) the hair muſt be ſhaven away, and at the firſt dreſſing a repelling Medicin applied, ſuch as this following *Oxyrhodinum*. ℞ *Ol. roſ.* ʒ iij. *albumen ovorum nu.* ij. *pulveris nucum cypreſſi, balauſt. alumin. rochæ. roſar. rub. an* ʒ i. Let them be all incorporated, and make a medicin for the former uſe; or inſtead thereof you may apply the cataplaſm preſcribed before, conſiſting of *Farina hordei, fabarum, aceto & oleo roſaceo*. But ſuch Medicins muſt be often renued. When the pain and defluxion are appeaſed, we muſt uſe diſcuſſing Medicins for diſſipation of that humour which remains impacted in the part; ℞ *Emplaſtri de mucilagin.* ʒ ij. *cicercoci, & emp. de melilato, an.* ʒ i. *olei chamæm. & anethi. an.* ʒ ß. *malaxentur ſimul, & fiat emplaſtrum ad uſum dictum.* Such a fomentation will alſo be good. ℞ *Vini rub. lib.* iv. *lixivii, com. lib.* ij. *nuces expreſſi contuſ. nu.* x. *pul. myrtillorum* ʒ i. *roſar. rub. abſinth. fol. ſalviæ, majoranæ, ſtœchados, florum chamæm. melil. an. M.* ß. *aluminis rochæ, radicis cyperi, calami aromatici an.* ʒ ß. *bulliant omnia ſimul*, and make a decoction to foment the grieved part. After ſomewhat a long fomenting it, whereby it may the better diſcuſs, dry and exhauſt the concrete humour, the head muſt be dried and more diſcuſſing things applied, ſuch as the Cerate deſcribed by *Vigo*, called *De Minio*; which hath an emollient and digeſtive faculty in this form. ℞ *Olei chamæm. lilior. an.* ʒ x. *olei maſtich.* ʒ ij. *pinguedinis vervecis lib.* i. *litharg. auri* ʒ viij. *minii* ʒ ij. *vini boni cyathum unum, bulliant omnia ſimul baculo agitando, primum quidem lento igne, mox vero luculentiore, donec tota maſſa colorem nigrum vel ſubnigrum contrahat; adde in fine cocturæ Terebinth. lib. ſ. pulveris maſtich.* ʒ ij. *gum. elemi.* ʒ i. *ceræ quantum ſufficit, bulliant rurſus una ebullitione & fiat empl. molle.* But if the humour 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 humour, the bone under it putrefies alſo by the contagion of the inflammation 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 Medicin. ℞ *Syrupi roſ. & abſinth. an.* ʒ j. *terebinth.* ʒ ß. *pul. ireos, aloes, maſtichis, myrrhæ, farinæ hordei, an.* ʒ ß. In ſtead hereof, if there be great putrefaction, *Ægyptia*, either by it ſelf, or mixt with an equal quantity of *Unguentum Apoſtolorum* may be put into the Ulcer. When the Ulcer is cleanſed, it will be time to uſe ſarcotick and cicatrizing Medicins.

Cerate de Minio.

Deterſive or cleanſing Medicins.

CHAP.

CHAP. XVI.

Of the particular cure of a Fracture or broken Skull.

IF the Skull be broken, ſo that it be needful 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 Brain, we muſt labour to mitigate the pain for fear of inflammation and other accidents. Therefore the firſt dreſſing ended, and the corners of the Wound drawn each from other; at the ſecond dreſſing put to the Wound a Digeſtive (as they term it) made of the Yolk of an Egg and Oil 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 applied to them, which may conſume the ſuperfluous humidity. Therefore we muſt lay ſome lint and 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 air, or touch of humid Medicins. You muſt in Trepaning have a ſpecial care of the *Craſſa Meninx*. For I have often obſerved a great quantity of bloud to have flowed from ſome broken Veſſel 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 Fever, and together therewith the reſt of the ſymptoms 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, inflammation and other accidents will be leſs troubleſom; alſo it is not amiſs too for old Ulcers to bleed much, for ſo they are freed from the burden of the impact humours. When you think it hath bled ſufficiently, it may be ſtanched with this following Medicin 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.

℞ *Pulveris Aloes* ʒ ij. *thuris Maſtiches, an.* ʒ i ß. *albumina ovorum nu.* iij. *agitentur ſimul cum pilis leporinis mixtim inciſis, fiat medicamentum.* When the bleeding is ſtaid, you ſhall, for the aſſwaging of pain, drop upon the *Meninx* ſome Pigeons bloud, yet warm by opening a Vein under the Wing, then it ſhall be ſtrewed over with this following Powder: ℞ *Aloes, Thuris, Myrrhæ, Sanguinis draconis an.* ʒ i. *Miſce, fiat pulvis ſubtilis.* Alſo you may make an irrigation with Roſe Vinegar, or ſome repelling Medicin ſuch as is a Cataplaſm *ex farinis, & oleo roſaceo.* Which may be applied until the fourth day to aſſwage and mitigate pain.

Gal. 6. meth.

Vigo's 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 dries moderately, and by reaſon of the ſmell refreſhes the animal ſpirits, and ſtrengthens the Brain and Membranes thereof, as you may eaſily perceive by things which enter into the compoſition thereof. ℞ *Olei roſ. Omph. reſinæ pini, gummi Elemi, an.* ʒ ij. *Maſtiches* ℥ i ß. *pinguedinis vervecis caſtrati* ℥ ij. ß. *foliorum beton. caprifol. anthos, an. M.* i. *ammoniaci* ʒ ß. *granorum tinctorum* ʒ x. *liquata pinguedine; terenda 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.* ℥ iv. *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 mollifying the Nerves, leſt they ſhould ſuffer Convulſion; ſuch is this.

Vigo's Cerate good for a broken skull.

℞ *Rutæ, marrubii, roriſmar. ebulor. ſalviæ, herb. paralyſ. an. M. ſ. rad. Iridis, cyperi, baccarum Lauri, an.* ʒ i. *florum chamæmelil. hyperici, an. M.ß. pigentur & macerentur omnia in vino albo per noctem, deinde coquantur in vaſe duplici cum oleo lumbricorum, liliorum, de terebinthina, axungiæ anſeris & hum. an.* ʒ ij. *uſque ad conſumptionem vini, poſtea colentur, & in colatura adde terebinth. veter.* ℥ iij. *aquæ vitæ* ʒ ß. *ceræ quantum ſufficit. Fiat linimentum ſecundum artem.*

A liniment good againſt Convulſions.

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 oily things muſt be ſhunned in the cure thereof, unleſs peradventure there ſhall be ſome need to mitigate pain, and bring the humour to ſuppuration.

Gal. 4. meth.

For, according to *Galen*, we are oft forced for a time to admit the proper cure of the diſeaſe, ſo to reſiſt the ſymptoms; 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 inflammation; for Wine if it be red, tart, and aſtringent, hath a repreſſing, refrigerating and drying faculty: for otherwiſe all Wine, although it heats and dries by its faculty, yet it actually humects and cools, both which are very hurtful 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 evil ſymptom. Wherefore let this be rarified, that is, we muſt not uſe humid and unctuous Medicins in Wounds of the head, except for curing of inflammation, 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 drineſs 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; *Thus, Radix Iridis flor. farina hordei, & Ervi, pulvis Aloes Hepaticæ, 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, inflammation, and apoſtumation be paſt; that is, then, when the Membranes muſt be cleanſed, the bones ſcaled, and the fleſh generated. For the skull, by how much it is the drier, by ſo much it requires and more eaſily endures more powerful and

How far humid things are good for a fractured skull.

Why Cephalick or Catagmatick Powders are good.

When to be uſed.

How to be mixed when they are to be applied to the *Meninges*.

and drier Medicins 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 fore-mentioned cephalick Powders to the *Meninges*, they muſt be aſſociated and mixed with Honey, Syrup of Roſes, or of Wormwood, and ſuch other like, that ſo their too violently-drying faculty may be allayed and tempered.

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, cleanſed, waſted, and dried up, which by the breaking of any veſſel is poured forth upon the Membranes, whereby they, and not they onely, but the Brain alſo is in a great danger of corruption. The third is, for the fitter application of Medicins, 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, and ſuch a 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 ſphærical or round figure of the head, which doth not eaſily admit binding; and 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 repel the running bloud. And the external Veſſels (to whom the force of the Ligature may come) cannot be bound without great pain, and danger of inflammation. For by ſuch a compreſſion the pulſation of the Arteries would be intercepted, and the efflux of the fuliginous excrements which uſeth to paſs through the ſutures of the Skull, would be ſuppreſt, by reaſon of the conſtriction of theſe ſutures.

Why a repelling Ligature cannot be uſed in fractures of the skull.

How the Patient muſt be placed when you Trepan him.

Beſides alſo, the bloud would thus be forced from the wounded part without, to within into the Membranes and Brain; when pain, inflammation, a Fever, Abſceſs, Convulſion, Palſie, Apoplexy, and laſtly Death it ſelf would enſue.

And theſe are the chief cauſes that Trepaning is neceſſary in fractures of the Skull, and not ſo in the fractures of other Bones.

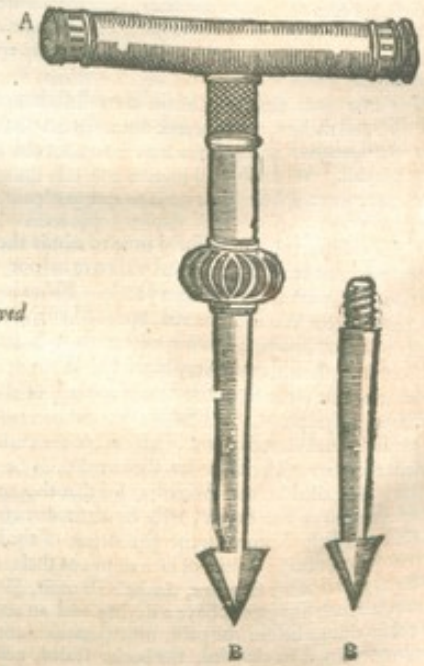
But before you apply or put to your Trepan, the Patient muſt be fitly placed or ſeated, and a double cloth muſt be many times wrapped about his head, and then his head muſt be ſo laid, or preſſed upon a Cuſhion or Pillow, that when you come to your operation, it may not ſink down any further, but remain firm and ſteddy. Then you muſt ſtop the Patients Ears with Cotton-wool, 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 than the pin of a Trepan, that ſo the Trepan which is forthwith to be applied may ſtand the more firm, and not to play to and again in too wide a hole.

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 of the Trepan.



A *Shews the handle.*

B *The points which may be ſcrewed and fitted 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 entered, 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 until you have cut through both the tables; Your Trepans must also have a cap, or somewhat to engirt or encompass 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 oil, that so they may cut 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 off, its scales and falls away. Now you must know that the bone which is touched with the Trepan or the Air, always casts off scales: for the speedier helping forwards whereof, you must strew upon it powders made of Rocket, Briony, wild Cucumber, and *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 to harden it with driness convenient to its kind. *℞ Pulver. Iridis Illyricæ, Aloes Manne thuris, Myrrhæ Aristolochiæ, an.* ʒ i. Flesh being by this means generated, let it be cicatrized by strewing upon it the rinds of Pomegranates 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.

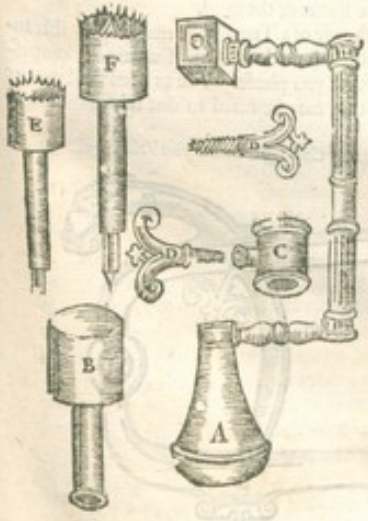
He which useth the Trepan, must consider this, that the head is of a round figure, and also the Trepan cuts circularly, and therefore it is impossible to cut the bone so equally on every side, as if it were performed upon a plain body. Furthermore the thickness of the skull is not alike in all places, 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 you 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.

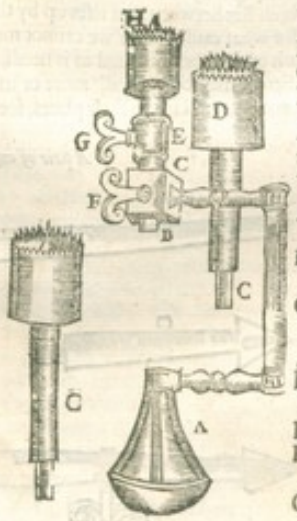
But seeing there are many sorts of Trepans invented and expressed by many men, yet if you weigh and rightly consider them all, you shall find none more safe, than that I invented and have here delineated. For it cannot pierce one jot further into the skull, than he pleases that uses it, and therefore it cannot hurt either the *Meninges* or the Brain. An iron head or cover, stays it as a bar, that it can penetrate 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 go 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.



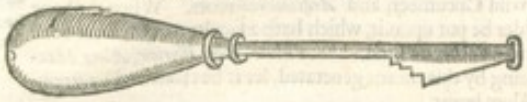
A *Shews the whole handle or Brace of the Trepan.*
B *The Cover or Cap of the Trepan.*
C *The ferule.*
D D *The Screw-pins which hold and stay the ferule and Trepan.*
E *The Trepan without his pin.*
F *The Trepan furnished with its pin.*

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 fastned 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 Dr. *Crook*.

A Terebellum *or Gimblet conſiſting of three branches.*

A Lentil-like cutting Scraper.



All theſe particulars of the Trepan taken aſunder, 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 three-ſquare 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 planted with this Lentil-faſhioned ſcraper; being ſo called, becauſe it hath the head thereof faſhioned and ſmooth like a Lentil, leſt being ſharp 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 the Lentil-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 pieces of the Bone. But if the fractured part of the Skull be ſuch, that it will not admit that Section which is requiſite for the bared bone, as when the fracture is upon the temporal muſcle, or at the ſutures; then in the ſtead of one Trepan, two or three muſt be applied, if the neceſſity of the preſent caſe ſo require, and that within a very ſmall compaſs; but they muſt not be applied to the fractured part, but nigh thereto, as we ſhall ſhew more at large in the following Chapter. But the Trepans ſhall be applied ſo near to each other, that the ring of the ſecond may be joined 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 faſtned to the Skull, and yields 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 ſuture of the ſkull.

Why a Trepan muſt not be applied to the ſutures.

Why 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 needful. 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.

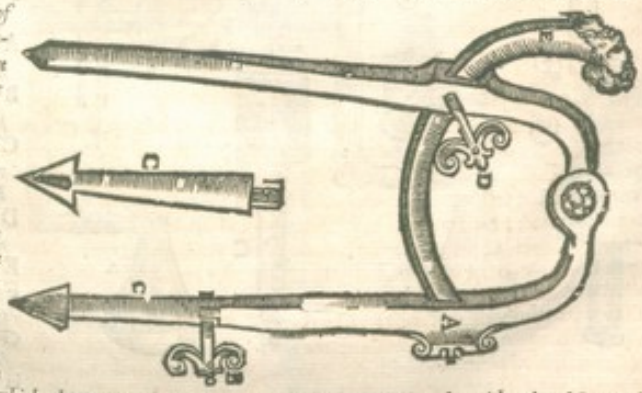
A pair of cutting Compaſſes to cut forth the Skull.

A *Shews the one leg of the cutting Compaſſes, which as you carry it about, cuts the ſkull.*

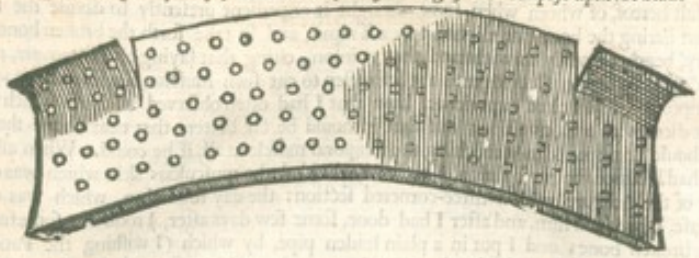
E *The Screw, which faſtens the point to the leg of the Compaſſes.*

CC *Two different points which may be ſcrewed to the leg of the compaſſes, as need ſhall require.*

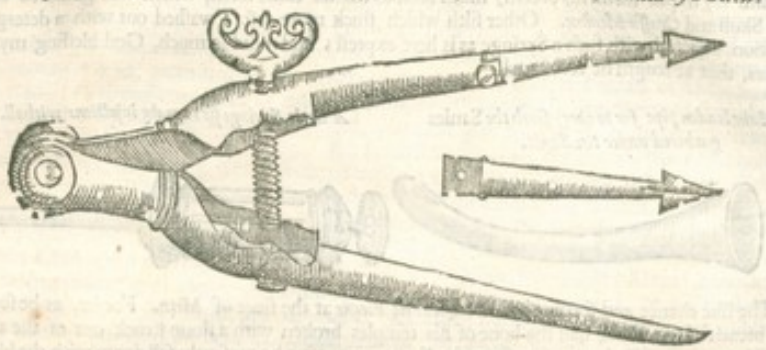
D *A great ſcrew which faſtens upon an Iron ſtring, alongſt which the one of the legs of the Compaſs running may be widened and ſtraitned as you pleaſe.*



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, whilest 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, lest by your weight and 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-brows, for those reasons we gave you before in the twelfth Chapter. For there is in that place under the first Table of the Skull it self, a large cavity replenished with a certain white and tough humour, as also with a certain spirituous and airy substance, placed there by Nature, to prepare the air which ascends to the Brain by the Nostrils: unless the Chirurgeon observe and be mindful 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. Sixthly, nor to the temples by reason of the temporal 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 Jaw; but then the opposite temporal muscle being whole and perfect, using its strength, (his Antagonist suffering it, and not resisting or labouring any thing at all to the contrary) it draws the same Jaw 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 equal 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 fore-head bone.

Lib. de Vul.

A rule of *Hippocr.*

Neither doth this danger alone arise from the cutting of the temporal muscle, but also another, which is, that this muscle when we eat and speak, is in perpetual motion, whereby it comes to pass, that being once cut, it is scarce ever united again, beside also the commissure or joyning together of the stony bones, lie under it. But by the second caution we are forbid to trepan upon the sutures; moreover also many Veins, Arteries, and Nerves are spread over the substance thereof, so that by cutting of them, there is danger of many and malign symptoms, as pain, inflammation, a Fever, a Convulsion not onely of the part it self, but also of the whole body, whence lastly death ensues. 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 near to the affected part as I can, as I did in a Gentleman called *Monsieur de la 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 temporal muscle was vehemently contused, yet without any wound. I being called the next day (viewing the manner of the hurt, and the

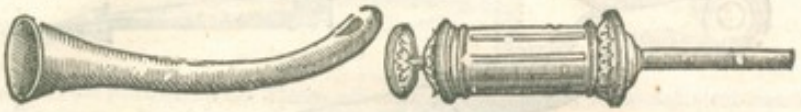
What discommodities arise from cutting the temporal muscles.

A History.

the condition of the wounded part) thought good to bring some Physicians 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, began 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 fore-mentioned symptoms; also I cited experience, how that I had often observed all those which had this muscle cut died with a Convulsion; but that it should be far better, that near above the fracture the bone should be trepaned, not touching the temporal 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 days 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 dresst 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 expresst; and I did so much, God blessing my endeavours, that at length he recovered.

A plain 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 befel *Monsieur de Pienne* at the siege of *Metz*. 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 piece of Ordnance shot from the Emperours camp, he presently fell down with the blow, and cast bloud out of his mouth, nose, and ears, with much vomiting, and remaining dumb, and as it were, senseless almost fourteen days, so that he knew none of the by-standers. He had often palpitations, and convulsive twitchings, and his face was swollen. His fore-head bone was trepaned at the side of the temporal 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 Powders, 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 sancti Fiacrii* [*i.* the Fig of S. *Fiacrye.*] 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 humour sweats through the bark, and gathered together by little and little grows into a Mushrom; so bloud melancholy both in temper and consistence, springs from the broken vessels of the skull and *Crassa Meninx*, which also is sent sometimes by Nature for the necessary repairing the flesh in these parts, whereupon a certain *Fungus* breeds, which in *Galens* opinion favours or partakes of the nature and condition of the parts to which it grows, though in general it be of the nature of malign Warts or Excrescences. But for to take away such *Fungi*, you must apply medicins which have a specifick faculty to waste superfluous flesh; such are those which strongly dry, and gently waste and eat, such as this which follows. ℞ *Sabinæ* ℥ ij. *cereæ* ℥ i. *pulverisentur simul, aspergatur caro excrescens.* Or else ℞ *Hermodactylorum combustorum* ℥ β, make a powder for the same use. But if so be that this fungous flesh come to such growth, (as it often happens) as to equal 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 fore-mentioned Powders, 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 Sphacel 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 oily Medicins becoming more moist, and so undergoing an unnatural 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 unnatural change and corruption, partly

The signs of foulness of the bone. 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

Corrupt bones are sometimes hard. rotten bones, which being bare had long suffered the injury of the air, to become so hard, that a Trepan would scarce pierce them; for it is putrid humidity which makes the bones soft and fungous, but

but the air by drying them exhauſts this humidity, and laſtly dries it, whence follows ſuch contumacious hardneſs. 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 actual as potential; or with powders of *Aloes, Gentian, Ariſtolochia, Centaury, Cortex pini*: as ℞ *Radic. Ireos, Flor. Ariſtolochiæ, an.* ʒ i. *centaur.* ʒ ij. *corticis pini* ʒ ℔, *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, 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 environed the Trepan, is commonly performed in the ſpace of forty or fifty days. So long alſo will that cauſed by the unuſual appulſe or touch of the air, or application of a cautery, or the aſperſion of the Cephalick Powders; beſides alſo, in the ſame number of days broken bones may be united and joined 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 *rotteneſs* can neither by theſe fore-mentioned remedies be overcome and amended, neither the looſed continuity agglutinated or united, you muſt give the Patient a vulnerary Potion; for hence I have found happy ſucceſs in many. But ſometimes not onely a certain portion of the bone is taken with a *Caries*, but alſo the whole is often ſeized upon with a ſphacel, and all falls 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, whileſt I ſerved as a Chirurgeon in *Piemont* under the Marſhal *de Montejan* (who was the Kings Lieutenant there.) It happened that a Lacquey of *Monſieur de Coulains* 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 days after his recovery, the bone being agglutinated and united, it came to paſs that a company of *Gaſcoign* Souldiers (his Country-men) came to *Turin*, with whom one morning he eat plentifully Tripe fried with Onions and Spices, and drank a great quantity of ſtrong Wine. Whereupon he preſently fell into a continual Fever 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 bloud, having firſt (by the Phyſicians advice) given him a Clyſter, and applied to his head ſuch things as were fit; and alſo I laboured with Frictions and Ligatures of the extreme parts, to draw the humours downwards, yet for all this the part of the head which was formerly affected begun to apoſtumate; 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 putrified and rotten, as you might know by their blackneſs and ſtench. Now to take away this corruption, I applied at certain times actual cauteries, both to amend the corruption and ſeparate that which was altered: but mark, after ſome moneths ſpace, a great number of Worms came forth by the holes of the rotten bones from underneath the putrified 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 among 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 die 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 bloud can neither freely nor plentifully ſweat through for matter to regenerate fleſh. Hence it is that wherefoever 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 Lacquey to wear a Cap made of thick Leather, ſo more eaſily to withſtand external 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, perſuade 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, and turn it divers ways and 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 couzened. Others brag that they are able to put the dried rind of a Gourd in the place of a loſt bone, and faſten it on to defend the part; and thus they groſly 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 hair, 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 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 rottenneſs 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.

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-royal] mixed with Barley-flour. In stead whereof this following Powder having the like faculty, may take place.

Remedies for the lacerated *Meninx*.

℞ *Colophon* ʒ iij. *Myrrhæ, Aloes, Masticbes, Sanguinis Draconis. an.* ʒ i. *crocí, sarcocollæ, an.* ʒ ß. *misce & fiat pulvis subtilis.* But to purge the bloud and matter which is gathered and lies between the *Crassa Meninx* and skull, you shall put in a Tent made of a rag twined up some four or five double, and steeped in Syrup of Roses or Wormwood, and a little *Aquæ Vitæ*; for thus you shall 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 renew the fore-mentioned Tent, untill all the matter be purged forth. And so often also you shall press down with this 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 expresst.

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 fore-mentioned Powder, a sponge moistned and wrung forth of a drying decoction made of aromatick and cephalick things, such as this which follows. ℞ *Fol. salviæ, majoran. betonicæ, rosar. rub. absinth. Myrtil. florum chamæm. melil. stœchad. utriusque an. M.* iij. ß. *rad. cyperi, calam. aromat. ireos, caryophyllatæ, angelicæ, an.* ʒ. ß. *bulliant omnia secundum artem cum aqua fabrorum & vino rubro, fiat decoctio ad usum dictum.* An in stead hereof you may use Claret with a little *Aquæ Vitæ*, that so the contained matter may be evacuated and dried up. A Sponge 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 softness it yields to the pulsation of the Brain. Then apply to the Wound and all the adjoining parts, an Emplaister of *Discalceatheos* dissolved with Vinegar or Wine, or Oil of Roses, that so the Plaister may be the more cold and soft. For, in *Hippocrates* opinion, nothing which is any thing heavy or hard must be applied to the wounds of the head, neither must it be bound with too strait or hard a ligature, for fear of pain and inflammation.

A Sponge fit to foment withall.

Lib. de vuln. cap.

Lib. de fasciis. The discommodities of too strait binding of the head.

For *Galen* tells (as he had it from *Mantias*) that a certain man had lost his eyes by inflammation and impostumation, ariting for that an Apothecary had used too strait a ligature to his head and face; for this strait ligature so prested 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 increased, 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 Emplaisters be soft which are applied to the head, as also the cloaths wherewith it is bound up to be of soft and thin Linnen, or of Cotton or Wool. When the Patient is in dressing, if there come much matter out of the Wound, you shall wish him if he can, to lie upon the wound, and now and then by fits to strive to breathe, stopping his mouth and nose, that so the brain lifted and swollen upwards, the matter may be the more readily cast forth; otherwise suffer him to lie so in his bed, as he shall best like of, and shall be least troublesom to him. You may with good success put upon the *Crassa Meninx* Oil of Turpentine with a small quantity of *Aquæ Vitæ* and a little Aloes and Saffron finely powdered, to cleanse or draw forth the *Sanies* or Matter, Or else, ℞ *Mellis rosar.* ʒ ij. *farinæ hord. pulver. aloes, masticb. & Ireos florent. an.* ʒ ß. *Aquæ Vitæ, parum*; let them be incorporated together and make a deterstive Medicin for the aforesaid use.

What cloaths we must use.

How the Patient must lie in his bed.

Paulus lib. 6. cap. 90.

Sometimes also the *Crassa Meninx* is inflamed after Trepaning, and swollen by a *Phlegmon*, that, impatient of its place, it rises out of the hole made by the Trepan, and lifts it self much higher than the skull, whence grievous symptoms follow. Wherefore to prevent death, of which then we ought to be afraid, we must enlarge 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 breathe and pass forth, and then we must go about by the prescript of the Physician 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. fon. psillii, ros rub. an.* ʒ i. *folani, plantag. an. M.* i. *bulliant in aqua sepida communi, ex qua fiat fotus.* Anodyne and repelling Medicins shall be dropped into his ears, when it is exceedingly swollen, that the tumor may subside, you shall cast upon it the meal or flour of Lentils, or Vine leaves beaten with Goose grease. With all which remedies, if the tumor do 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 and 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 cases to

Remedies for the inflammation of the *Crassa Meninx*.

How we must open the *Crassa Meninx* when it is impostumate.

to try a doubtful remedy than none at all; alſo it oft-times happens, whether by the violence of the contuſion and blow, or concretion, or clotting of the bloud which is ſhed, or the appulſe of the cold air, or the raſh application of Medicins 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 ſymptom the Chirurgeon muſt have a great and ſpecial care.

The cauſes and remedies of the blackneſs of the *Dura Mater*.

Therefore that thou mayeſt take away the blackneſs, cauſed by the vehemency of the contuſion, you ſhall put upon it oil of Eggs 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 boiled in Water and Wine; and *Vigo*'s Cerat formerly deſcribed ſhall be applied. But if the harm come from congealed bloud, you ſhall withſtand it with this following remedy. ℞ *Aquæ vitæ* ℥ ij. *granor. tinctorum in tenuem pulverem tritorum* ʒ ij. ß. *croci*, ℈ i. *Mellis roſat.* ℥ ij ß. *ſarcocol.* ʒ iij. *Leniter & ſimul bulliant omnia, & de colatura infundatur, quouſque nigrities fuerit obliterata.* If this affect come by the touch of the air, it ſhall be helped with this following remedy. ℞ *Tereb. ven.* ℥ iij. *Mellis roſ.* ℥ ij. *Vitellum ov. unum, farin. hordei* ʒ iij. *croci* ℈ i. *ſarcocol.* ʒ ij. *aq. vitæ* ʒ ij. *incorporentur ſimul, & bulliant paululum.* This remedy ſhall be uſed until the blackneſs be taken away, and the Membrane recover its priſtin colour.

Remedies for contuſion.

For congealed bloud.

For the hurt received by the air.

But if this affect proceed from the raſh uſe of Medicins, it muſt be helped by application of things contrary. For thus the offence cauſed by the too long uſe of moiſt and oily Medicins may be amended by uſing catagmatick and cephalick powders; but the heat and biting of acrid Medicins 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 hardning heat. But when ſuch blackneſs proceeds from putrefaction, *John de Vigo* commends the following remedy. ℞ *Aquæ Vitæ* ʒ ij. *mellis roſat.* ℥ ß. But if the affect be grown ſo contumacious that it will not yield to this gentle remedy, then this following will be convenient. ℞ *Aquæ Vitæ* ℥ iij. *mellis roſ.* ℥ i. *pulver. Mercur.* ʒ ij. *omnia ebullitione bulliant ſimul ad uſum dictum.* Or, ℞ *Aq. vit.* ℥ i ß. *ſyrup. abſinth. & mellis roſat. an.* ʒ ij. *unguenti Ægyptiaci* ʒ i. ß. *ſarcocol. myrrhæ, aloes, an.* ʒ i. *vini albi boni & odoriferi,* ℥ i. *bulliant leviter omnia ſimul, colentur ad uſum dictum.* But if the force of the putrefaction be ſo ſtubborn that it will not yield 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 Alum. Neither muſt we be afraid to uſe ſuch remedies, eſpecially in this extreme diſeaſe of the *Dura Mater*, for in *Galens* opinion the *Craſſa Meninx*, after the ſkull is trepaned, delights in Medicins 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 Medicins; the other is, which muſt be the chief and prime care of the Phyſician, 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 near; 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 increaſed ſo much, that the *Dura Mater* riſing far above the ſkull, remains unmovable, 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 gangrene of a noble part, as alſo by extinction of the native heat.

What Medicins make the *Craſſa Meninx* black.

Medicins againſt the putrefaction of the *Meninx*.

Why 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, ſigns, and ſymptoms 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 Veſſel is broken under the ſkull, it is fit preſently to open the cephalick Vein, and let bloud 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 Phyſician. Then when you have ſhaved away the hair, you ſhall apply to the whole head and often renue the fore-mentioned Cataplaſm, *Ex farinis, oleo roſaceo, oxymelite*, and other like cold and moiſt repelling Medicins. But you muſt eſchew dry, and too aſtringent Medicins muſt be ſhunned, ſuch as are *Unguentum 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 do not onely not hinder the inflammation, but fetch it when it is abſent, or increaſe it when preſent. The belly ſhall be looſed with a Clyſter, and the acrid vapours drawn from the head; for which purpoſe alſo it will be good, to make frictions from above downwards, to make ſtraight ligatures on the extreme parts, to faſten large cupping-glaſſes with much flame to the ſhoulders and the original of the ſpinal marrow, that ſo the revulſion of the bloud running violently upwards to the brain, and 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 Lambdal future, by reaſon of the community it hath with the Veins of the brain, and ſhutting the mouth and noſe to ſtrive powerfully to breathe. For thus the membranes ſwell up, and the bloud gathered between them and the ſkull, is thruſt forth, but not that 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 days the *Vena frontis* or fore-head Vein may be opened, as alſo the Temporal Arteries, and Veins under the Tongue, that the

What the concuſſion of the Brain is.

The opening of the *Vena Puppis*.

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 until the 14. day, for that until that time the fearful ſymptoms commonly reign. But repelling Medicins muſt be uſed until the 14. day be paſt, when we muſt come to diſcuſſing Medicins, beginning with the more mild, ſuch as is this following decoction. R *Rad. Alth.* ℥ vj. *irros, cyperi, calam.arom. an.* ℥ ij. *fol.ſalviæ, majoran. betonic. flor. chamæm. melil. roſ.rub. ſtæchad. an.M.* β. *ſalis com.* ℥ iij. *bulliant omnia ſimul ſecundum artem cum vino rub. & aqua fabrorum, fiat decoctio.* Let the head be waſhed therewith twice a day with a Sponge. 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 inflammation. Then you ſhall apply the Cerate of *Vigo* which hath power to diſcuſs indifferently, to dry, and draw forth the humours which are under the skull, and by its Aromatick force and power to confirm and ſtrengthen the Brain; it's thus deſcribed. R *Furfuris bene triturati* ℥ iij. *farin. lentium* ℥ ij. *roſ. myrtillor. foliorum & granorum ejus, an.* ℥ i. *calam. aromat.* ℥ i. β. *chamæmel. melil. M.* β. *nuces cupreſſi num.* vj. *olei roſacei, & chamæm. an.* ℥ iij. *ceræ albæ* ℥ ij. β. *thuris, maſtichis, an.* ℥ iij. *myrrhæ* ℥ ij. *in pulverem quæ redigi debent redactis, & liquefactis oleis cum cera, omnia miſceantur ſimul & fiat mixtura, quæ erit inter formam emplaſtri & ceroti.*

A diſcuſſing fomentation.

A caution in fomenting the head.

A deſcription of *Vigo*'s Cerate.

Vigo ſaith that one of the Duke of *Urbins* Gentlemen found the Urine hereof to his great good: He fell from his Horſe with his head downwards upon hard Marble, he lay as if he had been dead, the bloud guſht out of his noſe, mouth, and ears, and all his face was ſwollen, and of a livid colour; he remained dumb twenty days, taking no meat but diſſolved Gellies, and Chicken and Capon broths with Sugar; yet he recovered, but loſt his memory, and faltered in his ſpeech all his life after. To which purpoſe is that Aphoriſm in *Hippocrates*; Thoſe that 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 Cerate 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 yielding to reaſon, that they ſtiffly 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 refel 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 bloud flowing from their noſe, mouth, or ears, it helps their diſeaſe.

A Hiſtory.

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 inæqual. intemp. Rhaſ. cap.4. continent. Avicen cap.de ixit. 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, and was beſides hard bound in his Belly. Wherefore preſently a Fever and *Delirium*, with other horrid ſymptoms aſſailed him, for he was not trepanned becauſe there appeared no ſign of fracture in the skull: on the ſeventh day he fell into a great ſweat with often ſneezing, 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 ſymptoms, and recovered his health.

A Hiſtory.

Lib. 8. de uſu part. & com. ad Aph. 18. ſect.6.

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 Marſhal 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 haſel Nut of the Brain came forth thereat. Which I obſerving, preſently pronounced the wound to be deadly; a Phyſician 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 the 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 animal ſpirits, and the heat of vapours riſing thither from all the body, they do not ſuffer fat to concrete about them. But with experience, for that in 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 bottom.

Why fat cannot be generated under the skull.

Signs of a fatty ſubſtance.

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 piece of leather, but diſſolved not at all. Wherefore all thoſe which were preſent cried 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.

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 carelefly handled, they leave deformed ſcars in the moſt ſpecious and beautiful part of the body. The cauſes are the ſame which are incident to the skull, that is, external. But this may be added to the kinds nd differences of the wounds, that the life may be out of danger though any one whole part of the aFace(as the ear, eye, noſe, lip,) may be cut away by a wound, but not ſo in the Head, or Skull.

Where-

Wherefore beginning at the Wounds of the eye-brows, we will profecute in order the Wounds of the other parts of the face.

This is chiefly to be obſerved in wounds of the Eyebrows, 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 forced 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 the unskilfulneſs of the Chirurgeon who cured them, that is, by the negligent application of the boulſters, an unfit ligature, and more unfit future. In this caſe the skilful 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 ſew the Wound as is fit, with ſuch a ſtitch as the Furriers and Glovers uſe; and then he ſhall pour thereon ſome of the Balſom of my deſcription, and ſhall lay ſuch a Medicin to the neighbouring parts. ℞ *Olei roſar.* ℥ ſs. *albumin ovor. nn.* ij. *boli armen. ſanguin. Drac. Maſtich. an.* ℥ j. *agitentur ſimul, fiat medic.* 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, until 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 ſymptoms, or the Patients body be repleat with ill humours.

A thing to be obſerved in Wounds of the Eye-brows.

There ſometimes happen a quite contrary accident in Wounds of the Eye-brows, that is, when the eye-lids ſtand ſo up that the Patient is forced to ſleep with eyes open; wherefore thoſe which are ſo affected, are called by the *Greeks Lagophthalmi*. The cauſe of this affect is often internal, 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 extremes of the ſemicircle bend downwards, that they may be preſſed down and joined as much as is needful to amend the ſtiffneſs of the eye-lid. But you muſt not violate the griſle with your Inſtrument, for ſo they could no more be lifted up; the reſidue of the cure muſt be performed as is fit.

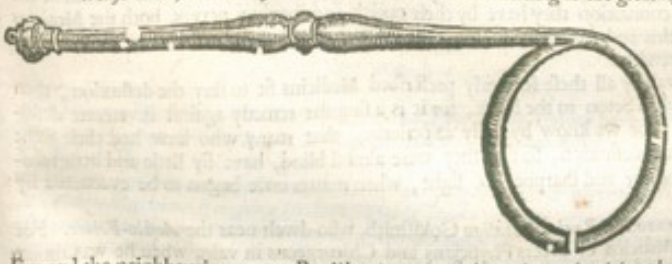
Lagophthalmia is a quite contrary accident to the falling down of the Eye-lids.

CHAP. XXIV.

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 always be varied according to the variety of the cauſes and differences. The firſt head of 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 eye-lid with the end of a *Spatula*. But if you cannot diſcern this mote 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 motes, which are not faſtned 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 medicin be put into the Eye. Take the ſtrains of a dozen Eggs, 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. nn.* iv. *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 Roſe-water, the white of an Egg, and as much *acacia* as ſhall ſuffice. This which followeth doth more powerfully ſtay the flowing humour. ℞ *gum. arab. & tragac. an.* ℥ ij. *piſtis cydon. ſem. portul. plant. ſtomach. an.* ℥ ij. *fiat mucilago 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 applied to the Eye.

But note, that all ſuch remedies muſt be applied warm, both that they may the better penetrate by their moderate heat, as alſo for that all actual cold things are hurtful to the eyes and ſight, becauſe they dull the ſight by incruſtating the viſive ſpirits. For I have known many who have become dull of ſight by the frequent uſing of Medicins actually cold to the eyes. I have on the contrary ſeen not a few, who have recovered with the fit uſe of ſuch like Medicins, 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 humour ran forth thereat.

Things actually cold are hurtful to the Eyes.

The milk of a Woman which ſuckles a Girl (for that is reputed the cooler) mitigates pain and cleanſes, if it be milked out of the Dug into the eye; to which purpoſe alſo the bloud of Turtles, Pigeons,

Anodyne Medicins for the Eyes.

Pigeons or Chickens much conduces, being dropt into the eye by opening a Vein under their Wings. Alſo this following Cataplaſm aſſwageth pain and inflammation, and hinders defluxion, being applied to the eye and the adjacent parts. ℞ *Carnis pomorum ſub cinere calido decoctorum* ℥ v. *vitel. ovorum num.* iij. *caſſiæ fiſtulæ recenter extractæ* ℥ ß. *mucaginis pſillii, althææ & cydon. an.* ℥ j. *farin. hordei parum, incorporentur omnia ſimul, fiat cataplaſma.* Alſo Sheeps Lungs boiled in Milk and applied warm, and changed as they grow cold, are good to aſſwage pain. But if the too violent heat and pain ſhall not yield to ſuch Medicins, but require more vehement, then *Foliorum Hyoſcyami, m.* j. *ſub. cinеribus coquantur, atque in mortario cum mucagine ſeminis pſillii, & cydonior. extracti. in aquis ſolani & plantag. piſtetur:* then let this Medicin be wrapped in a linnen cloth and applied to the Eyes and Temples. The mucilages of *Pſillium* or Flea-wort, and Quince-ſeed 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 Medicins, then ℞ *Syrup. roſar. ſiccat.* ℥ j. *aq. fœnic. & 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 Fennil Water, are fit for cleanſing 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 enſuing Medicin is very ſarcotick. ℞ *Mucagin. gummi olibani arabici, tragacanth. & ſarcocol. in aq. hordei extracti. an.* ℥ iij. *aloes ter lotæ in aq. roſar.* ℥ j. *ceruſ. 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 humours, acceſs and mixture of flatulencies, that it hides the whole *Pupilla*, and hangs forth of the eye-lids like as if it were an unnatural fleſhy excreſcence, and it loſes the native colour, and looks very red, ſo that the Eye can neither be ſhut nor opened.

Narcoticks.

Detergent Medicins.

A ſarcotick Medicin for the eyes.

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 waſte it with catharetick 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 Chamomil, Melilote, Roſe-leaves, Wormwood, Rue, Fennil and Anniſeeds, boiled in Milk with the roots of Oris and Marigolds. Then I preſently added this following Fomentation, being more powerful and drying. ℞ *Nucis cupreſſi, gallar. balauſt. an.* ℥ j. *plantagin. abſinth. hippuris, flor. chamæm. roſar. rub. an. M* ß. *bulliant ſimul, cum aqua fabrorum, & fiat decoctum pro fotu cum ſpongiis.* Beſides alſo you may apply a Cataplaſm made of Barley and Bean-flour, the Powders of Maſtick, Myrrhe, and Aloes, and ſome of the laſt deſcribed Decoction. The Tumour beginning to decline, I dropt the flowing Liquor into the Eye, which hath a very aſtringent, drying and ſtrengthening faculty. Roaſt a new laid Egg in Embers until it be hard, then pill off the ſhell, take forth the Yolk, and in place thereof put a ſcruple of Roman Vitriol in fine Powder, then put it in a linnen cloth and wring it hard forth into ſome clean thing, and drop thereof for ſome days into the Eye, with a little Smiths Water wherein Sumach and Roſe-leaves have been boiled. 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 always lay repercuſſives about the eye, that no harm enſue thereof. For divers times acrid humours fall down into the Eye with ſuch violence, that they break the horny coat, whereupon the humours of the Eye are poured out. Remember alſo, that in diſeaſes of the Eyes the Patient lie with his head ſomewhat high, and that he keep ſhut not onely the pained, but alſo the ſound Eye, becauſe reſt is always 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 Medicin to conſume a fleſhy excreſcence without biting.

But if we cannot prevail by all theſe formerly preſcribed Medicins 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 daily 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 began to be evacuated by the Seton.

A Seton, a good remedy againſt inveterate defluxions into the eyes.

A Hiſtory.

The truth hereof appeared in *Paul* the *Italian* Goldſmith, who dwelt near the *Auſtin-Friars*. For he having uſed many Medicins of divers Phyſicians 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, until 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 daily forth thereof) yet he would have it taken forth and healed up; but this way of evacuation being ſhut up, and the humour 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 Seton good againſt the Falling-ſickneſs.

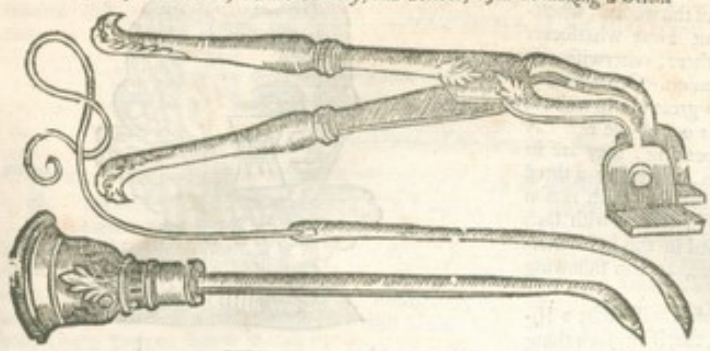
I alſo once freed by this kind of remedy, by appointment of the moſt learned Phyſician *Hollerius*, a certain young man of 20 years old, from the Falling-ſickneſs, who before had many fits thereof; the Ichorous humours, the feeders of this Diſeaſe, being by this means, as it is moſt probable, drawn away and evacuated.

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: With 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

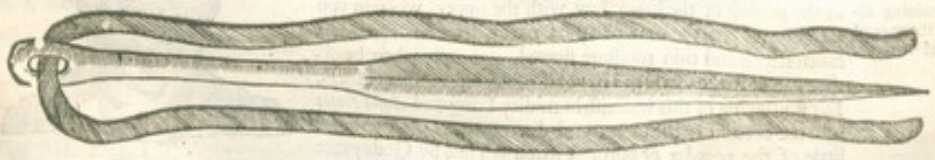
A Figure of the Pincers, actual Cautery, and Needle, uſed in making a Seton.



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 ſymptoms; you ſhall then twitch the skin which is held in the Pincers moſt hard, when you ſhall thruſt the hot Iron 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-ways, and not thwarting 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, and 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 and thred with a three or four-doubled thred of Cotton [or rather a skean of Silk] moiſtned in the white of an Egg and Oil of Roſes; then after you have applied pledgets dipped in the ſame Medicin, bind up the part with a convenient ligature. The day following the neck muſt be anointed with Oil of Roſes, and the pledgets dipped in the former Medicin applied for ſome days after. But it will be convenient to moiſten the Seton with a digeſtive made of the yolk of an Egg and oil of Roſes until the Ulcer caſts forth much matter; then you ſhall anoint the Cotton thred with this following remedy. ℞ *Terebinth.ven.* ℥ iv. *ſyrupi roſat. & abſinthii an.* ℥ ß. *pulv. Iridis, diacrydii, agarici trochiſc. & Rhei, an.* ℈ ß. *incorporentur omnia ſimul & fiat medic.* 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 painful than that which is performed with the actual cautery which I formerly mentioned. Wherefore I would adviſe the young Chirurgeon, that he no more uſe the aforeſaid actual 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 in the Cheek ſeems to require a Suture, it muſt have a dry 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 pieces of new cloth of an indifferent fineneſs, and proportionable bigneſs with this enſuing Medicin. ℞ *Pulveris Maſtichini, Sanguinis Draconis, Thuris, farinæ volatilis, tragacanthæ contuſæ, gypſi, piſti, ſarcocollæ, an* ℥ ij. *picis nigræ,* ℥ j. ß. *albumina ovorum quæ ſufficiant, fiat medicamentum.* Apply the pieces of cloth ſpread with this, on each ſide of the Wound one, ſome fingers bredth aſunder, and let it alone till it be hard dried 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 Medicins, Pledgets, Ligatures. But all the Ligatures and ſtays which ſhall be uſed for that purpoſe, muſt be faſtned 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, and 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 faſtned ſhall be there until 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 Womb by the errour of the forming faculty. But ſuch a ſu-

What hare-lips are.

ture will help nothing to agglutination, if there lie or remain any skin between the lips of the 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 perpetual motion, wherefore a thred 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 shews.

The Figure of the suture fit for cloven or hare-lips; as also the delineation of the Needle about whose ends the thred is wrapped over and under, to and again.

A History.

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 Gascoign in the battel of Saint *Laurence*, had his upper jaw cut overthwart even to his mouth, to the great disfiguring of his face. The wound had many worms in it, and stank exceedingly, because he could get no Chirurgeon until three days after he was hurt. Wherefore I washed it with a decoction of Wormwood, Aloes, and a little *Ægyptiacum*,

A decoction good to wash away putrefaction.

both to kill the Worms, and to fetch away all the putrid matter; I discussed the tumor with a dissolving fomentation and cataplasm, I joined together the lips of the Wound with the last described suture. But I applied this following Medicin to the whole part. ℞ *Terebinth. venetæ* ℥ vj. *gummi elemi* ℥ ij. *pulv. boli armeni, san. drac. Masticbes, Myrrhæ, Aloes, an.* ℥ ß. *incorporentur simul, fiat medicamentum.* The wound was agglutinated within a few days, but that there remained a certain little hole at the joining of the lower Jaw with the upper, wherein you could scarce put the head of a pin; out whereof nevertheless much serous and thin moisture flowed, especially when he either eat or spake; which I have also observed in many others. But for staying of this watersh humidity I dropped *Aqua fortis* into the bottom 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.

A small hole remaining after the cure of great wounds.

CHAP. XXVI.

Of the Wounds of the Nose.

How many ways the nose may be hurt.

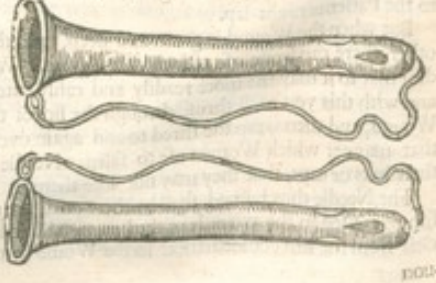
THe Nose many ways suffers solution of continuity; as by a Wound, Fracture, and Contusion, and it is sometimes battered and broken on the upper part; which when it happens, you shall restore the depresst bones to their native seat and figure, with the end of a *Spatula*, or fit stick wrapped about with Tow, Cotton, or a linnen rag. Then with pledgets dipped in an astringent Medicin composed *ex albumine ovi, Masticb. bol. armen. sanguin. drac. & alumine rotæ*, and applied 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 press them too much, left the Nose should become flat, as it happens to many through the unskilfulness of Chirurgeons.

The cure of a broken Nose.

The uses of Pipes in broken Noses.

Then must you put little Pipes into the Nostrils, and these not exactly round, but somewhat flat and depresst, tied to the night-cap on each side with a thred, left 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

The Figure of Pipes to be put into the Nostrils.



nou-

nourishment, then sew it up. For the lower part of the Nose, it may be shaken, depresst and wrested aside, seeing it is grisly; but it cannot be broken, as the other which is of a bony Nature.

CHAP. XXVII.

Of the Wounds of the Tongue.

THe Tongue may be so wounded, that either it may be wholly cut off and deprived of some portion of the substance, or onely slit long-ways, or athwart. The loss of the substance cannot be repaired, because every part separated and pluckt from the living body, from whence it had life, spirit, and bloud, presently dies. For, as Philosophers say, *à privatione ad habitum non est regressus.* But when it is cut or slit long-ways or side-ways, 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 careful 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, whilest the Chirurgeon stitch it above and below; when he thinks he hath sufficiently sewed it, let him cut off the thred as near 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 hurtful laceration or rending of the sewed parts. In the mean time let the Patient eat Barley-Creams, Almond-Milks, Gellies, Cullisses, and Broths, and the yolks of Eggs, and let him often hold in his mouth Sugar of Roses and Syrup of Quinces; for such things besides their nourishing faculty, perform the part of an agglutinating and detergent Medicin. I have learned these things I have here set down, neither from my Masters whom I have heard with attention, nor by reading of Books, but they have been such as I have tried 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*.

How many ways the continuity of the Tongue may be loosed.

The cure of a cloven tongue.

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 piece 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 Physician in curing Diseases; I also thought thus with my self, the flesh of the Tongue is soft, loose, fungous and spongy, neither is altogether spongy, neither is altogether obvious to the external injuries of the air; 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 cure of Diseases.

CHAP. XXVIII.

Of the Wounds of the Ears.

THe Ears are sometimes wholly cut off, sometimes but in part, otherwhiles they are onely slit, so that the rent portion as yet adhering to the rest, is joined 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 Grisle with your Needle, for thence there would be danger of a Gangrene, which happens to many by foolish curing; therefore you shall take up and comprehend with your Needle onely the Skin, and that little flesh which encompasses the Grisle. You shall perform the rest of the cure with Pledgets and Ligatures artificially fitted, and shall resist inflammation and other symptoms with fit Medicins. But you must take special 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 piece of sponge. But you shall procure agglutination and consolidation of the grisly 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 mishap with a cap, stuffed with Cotton on that side.

How many ways the unity of Ears may be violated.

How to sew a wounded Ear.

CHAP. XXIX.

Of the Wounds of the Neck and Throat.

THe Wounds of the Neck and Throat are somewhiles simple, as those which onely use the continuity of the Muscles; otherwhiles compound, such as those which have conjoined with them a fracture of the Bones, as of the *Vertebræ*, or hurt of the internal and external jugular Veins or sleepy Arteries; sometimes the *Trachea Arteria*, or Weazon, and the *Oesophagus* or Gullet are wounded; sometimes wholly cut off, whence present death ensues. Wherefore let not the Chirurgeon meddle with such Wounds, unless he first foretel 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 spinal marrow, also hurt therewith. Wounds of the Gullet and Weazon are difficultly cured, because they are in perpetual motion; and chiefly of the latter, by reason it is grisly and without bloud. The wounds of the Gullet are known, by spitting of bloud,

The differences of Wounds of the Neck and Throat.

The Palsie follows upon Wounds of the Neck.

Signs that the Gullet is wounded.

by the breaking forth of meat and 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 bloud at the mouth with a continual cough, and by the coming forth of the breath or wind 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 bloud 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 those 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 future, then you shall put therein a sufficient quantity of Venice Turpentine mixed with Bole-Armenick, or else some of my Balsam, of which this the Receipt. ℞ *Terebinth. venet.æ* ℔ß. *gum. cleoni* ℥ iv. *olei hypericonis* ℥ iij. *boli armen. & sang. draconis an.* ℥ j. *aquæ vitæ* ℥ ij. *liquefiant simul omnia lento igne, & fiat Balsamum ut artis est, addendo pulveris ireos florent. aloes, masticbes, myrrhæ an.* ℥ j. I have done wonders with this Balsom 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 Oil of Roses and Vinegar, as that which hath power to repress the flowing down of humours, and hinder inflammation, or in stead thereof you may apply *Emp. de Gratia Dei*, or *Emp. de Jauna*. But if the Jugular Veins and sleepy Arteries be cut, let the bleeding be staid, as we have shewed in a Chapter treating thereof. When the Weazon or Gullet are wounded, the Chirurgeon shall sew 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 Gellies and Broths. When a Gargarism is needful, this following is very good. ℞ *Herdei M.* j. *florum rosar. p.* j. *passul. mund. jujubarum an.* ℥ ß. *glycyrrhizæ* ℥ j. *bulliant omnia simul, addendo mellis ros. & Julep. ros. an.* ℥ ij. *fiat Gargarisma, ut artis est.*

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 Balsom.

The faculty of *Diacalcitheos*.

The cure of the wounded Weazon and Gullet.

A Gargarism.

The manifold use thereof

With which being warm, the Patient shall moisten his mouth and throat, for it will mitigate the harshness of the part, assuage pain, cleanse and agglutinate, and make him breathe more freely. But that the Chirurgeon may not despair of, or leave any thing unattempted in such like wounds, I have thought good to demonstrate by some examples how wonderful the Works of Nature are, if they be assisted by Art.

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 symptoms remained until such time as the Wound was sewed up and covered with Medicins. But if 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 bloudless 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 those 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 reciprocal 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 bloud he had lost, which is, as it were, the Treasure of Nature, I told those which were present, that death was near and certainly at hand. And yet beyond expectation, rather by Divine Favour than 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 massy 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 killed him, having with his Dagger cut the Weazon and Gullet. This Murderer came back to the City; the other half dead, crawled with much ado to a certain Peasants house, and being dressed with such Medicins as were present, and at hand, he was brought to the City, and by his acquaintance committed to my care to be cured. I at the first, as diligently as I could, sewed up the Weazon which was quite cut 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 dressed, he begun to speak, and tell the name of the Villain the author of this fact, so that he was taken and fastned to the Wheel, and having his limbs broken, lost his wretched life, for the life of the innocent wounded man, who died the fourth day after he was hurt.

Another History.

The like hurt befel a certain German who lay at the house of one *Perots*, 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, dressed him just after the same manner as I dressed the English man. Wherefore he presently recovered his speech, which before could not utter one syllable, freed from suspicion of the crime and prison the servant, who lying in the same Chamber with him, was upon suspicion committed to Prison, and confessing the thing as it was done, lived four days after the Wound, being nourished with Broths put into his Fundament like Clysters, and with the grateful vapour of comfortable things, as Bread newly drawn out of the Oven and soaked in strong Wine; I having thus by Art of Chirurgery made the dumb speak for the space of four days.

CHAP.

CHAP. XXX.

Of the 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, otherſome pierce even to the parts contained therein, as the *Mediaſtinum*, Lungs, Heart, Midriff, hollow Vein, and aſcendent Artery. Otherſome paſs quite through the body, whereby it happens that ſome are deadly, ſome not. The differences of wounds of the Cheſt.

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 break through the wound with a noiſe, ſo that it may diſſipate, or blow out a lighted Candle being held near it. If the Patient can ſcarce either draw, or put forth his breath, this alſo is a ſign that there is ſome bloud fallen down upon the *Diaphragma*. The ſigns.

By theſe ſigns you may know that the heart is wounded: If a great quantity of bloud guſh out, if a trembling poſſeſs all the members of the body, if the pulſe be little and faint, if the colour become pale, if a cold ſweat and frequent ſwooning aſſail him, and the extreme parts become cold, then death is at hand. Signs that the heart is wounded.

Yet when I was at *Turin*, I ſaw a certain Gentleman, who fighting a Duel with another, received a wound under his left breſt which pierced into the ſubſtance of his heart, yet for all that he ſtruck ſome blows afterward, and followed his flying enemy ſome two hundred paces until 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 onely much bloud poured forth upon the Midriff. A Hiſtory.

Theſe are the ſigns that the Lungs are wounded, if the bloud 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 lies moſt at eaſe when he lies 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. Signs that the Lungs are wounded.

When the *Diaphragma* or Midriff 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 Midriff; difficulty of breathing, a cough and ſharp pain troubles the Patient, the Guts are drawn upwards; ſo that it ſometimes happens by the 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. Signs that the Midriff is wounded.

The one of theſe was a Maſon, who was thruſt through the midſt of the Midriff, where it is nervous, and died 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 ſcarce 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 *Xantoign*, who before *Rochel* was ſhot with a Muſket Bullet, entring by the breſt bone near to the ſword-like Griſle, and paſſing through the fleſhy part of the Midriff, went out at the ſpace between the fifth and ſixth baſtard ribs. The wound was healed up on the outſide, 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 moneth after, the pain raging more violently in his belly than it was accuſtomed, he died; though for the mitigating thereof *Simon Malmedy* and *Anthony du Val*, both learned Phyſitians, omitted no kind of remedy. The body of the deceaſed was opened by the skilful 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 ſcarce put your little finger in thereat. But now let us return from whence we digreſſed. Another Hiſtory.

We underſtand that there is bloud poured forth into the capacity of the Cheſt by the difficulty of breathing, the vehemency of the increaſing Fever, the ſtinking of the breath, the caſting up of bloud at the mouth, and other ſymptoms which uſually happen to thoſe who have putrified and clotted bloud 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 lie 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 vital faculty which ſuſtains the body being broken and debilitated both by reaſon of the wound, and concrete or clotted bloud; for ſo putting on the quality of poiſon, it greatly diſſipates and diſſolves the ſtrength of the heart. Signs that there is bloud poured into the capacity of the Cheſt.

It is a ſign the ſpinal marrow is hurt, when a Convulſion or Palſie, that is, a ſudden loſs of ſenſe and motion in the parts thereunder, an unvoluntary excretion of the Urine and other excrements, or a total ſuppreſſion of them, ſeizes upon the Patient. When the hollow Vein and great Artery are wounded, the Patient will die in a ſhort time, by reaſon of the ſudden and abundant effuſion of the bloud and ſpirits, which intercepts the motion of the Lungs and Heart, whence the party dies ſuffocated. Signs that the Spine is wounded.

CHAP. XXXI.

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 vital ſpirits fly away and be diſſipated. Others on the contrary think that ſuch Wounds ought to be long kept open; *Vigo, tract. de Vulneribus cap.* 10.

open; and alſo if they be not ſufficiently large of themſelves that then they muſt be enlarged by Chirurgery, that ſo the bloud 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 Fever, 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 bloud poured forth into the capacity of the Cheſt. But the latter takes place where there is much more bloud contained in the empty ſpaces of the Cheſt. Which left I may ſeem raſhly to determin, I think it not amiſs to ratifie each opinion with a Hiſtory thereto agreeable.

A Hiſtory.

Whileſt I was at *Turin*, Chirurgeon to the Marſhal of *Montejan*, the King of *France* his General, I had in cure a Souldier of *Paris*, whoſe name was *Leveſque*, he ſerved under Captain *Renwart*. 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 bloud was poured forth upon the Midriff, which cauſed ſuch difficulty of breathing, that it even took away the liberty of his ſpeech; beſides through this occaſion he had a vehement Fever, coughed up bloud, and a ſharp pain on the wounded ſide. The Chirurgeon which firſt dreſſed 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 ſymptoms which threatned ſpeedy death, judged that the ſowing of the Wound muſt ſtraight be looſed, which being done, there inſtantly appeared a clot of bloud at the orifice thereof, which made me to cauſe the Patient to lie 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 Midriff be ſtretched forth, and the intercoſtal Muſcles and thoſe of the *Abdomen* ſhould be compreſſed, that the bloud 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 bloud; and certainly I drew out ſome ſeven or eight ounces of putrefied and ſtinking bloud by this means. When he was laid in his Bed, I cauſed frequent injections to be made into the Wound of a decoction of Barley, with Honey of Roſes and red Sugar; which being injected, I wiſht him to turn firſt on the one, and then on the other, and then again to lie out of his bed as before: for thus he evacuated ſmall, but very many clots of bloud, together with the liquor lately injected; which being done, the ſymptoms were mitigated, and 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 no longer endure it. Then it came into my mind that formerly I had obſerved the like effect of the like remedy in the Hoſpital 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 thenceforwards 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.

Why bitter things muſt not be caſt into the Cheſt.

But on the contrary, I was called on a time to a certain *German* 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 bloud poured forth into the capacity of the Cheſt becauſe the Patient had no Fever, no weight upon the *Diaphragma*, nor ſpitted forth any bloud. Wherefore I cured him in few days by onely dropping in ſome of my balſom 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 Fiſtulaes. 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 days, but when you ſhall find that the Patient is troubled with none or very little pain, and that the Midriff is preſſed down with no weight, and that he breathes freely, then let the tent be taken forth, and the Wound healed up as ſpeedily as you can by covering it onely with lint dipped in ſome balſom which hath a glutinative faculty, and laid ſomewhat broader then the Wound; never apply liniments 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 faſtned 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. Diacalcitheos*, or ſome ſuch like, be applied to the Wound. But if on the contrary, you know by proper and certain ſigns, that there is much bloud fallen into the ſpaces of the Cheſt, then let the orifice of the Wound be kept open with larger tents, until all the *ſanies* or bloudy matter, whereinto the bloud 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 Phyſician, the Wound degenerates into a *Fiſtula*, then the former evil is become much worſe. For *Fiſtulaes* of the Cheſt are ſcarce cured at any time, and that for divers cauſes. The firſt is, for that the muſcles of the Cheſt are in perpetual motion. Another is, becauſe they on the contrary inſide are covered onely with the membrane inveſting the ribs, which is without bloud. The third is, for that the Wound hath no ſtay, by means whereof it may be compreſſed, ſewed, and bound, whereby the lips being joined together, the Wound may at length be repleniſhed with fleſh and cicatrized.

Read the Hiſtory of *Maryllus* in *Galen, lib. 7. de Anatom. adminiſtr.*

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*.

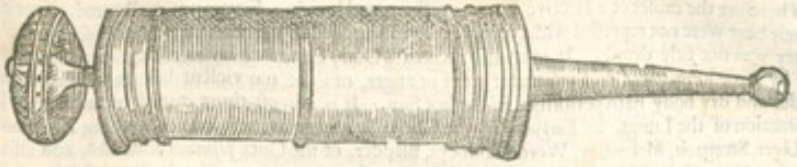
But the reaſon why Wounds of the Cheſt do every day heap up and pour forth ſo great a quantity of matter, ſeems to be their vicinity to the heart, which being the fountain of bloud, there is a perpetual efflux thereof from thence to the part affected. For this is Natures care in preſerving the affected parts, that continually and abundantly without meaſure or mean it ſends all its ſupplies, that is, bloud and ſpirits to their aid. Add hereto that the affected parts by pain, heat, and continual motion of the Lungs and Midriff, draw and allure much bloud to themſelves. Such like bloud

Why there flows ſuch plenty of matter out of wounds of the Cheſt.

bloud defiled by the malignity and filth of the wound, is speedily corrupted: whence it is that from the perpetual afflux of bloud, there is a continual 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 bloud 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 and phlebotomy, according to the prescript of the Physician) 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 *Syrup. 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 and 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.

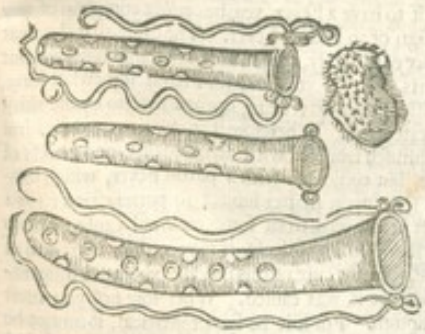
The cure of a *Fistula* in the Chest. When *Ægyptiacum* must be put into the injections.

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 tied with strings, that it may not fall into the capacity of the Chest. A great Sponge 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 yields 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 chirurgical Section, a passage shall be made in the bottom, as we said before in an *Empyema*.

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 onely two or three in their ends: for the flesh growing and getting into the rest, makes 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 enlarged by coughing, and thence also arises inflammation; the *Pus* and *Sanies* whereof, whilst the lungs again endeavour to expel by coughing, by which means they are onely able to expel that which is hurtful and troublesom to them, the ulcer is dilated, the inflammation augmented, the Patient wasties away, and the Disease becomes incurable.

What wounds of the Lungs are curable.

The harm that ensues upon coughing, in Wounds of the Lungs.

There have been many *Eclegmata* described by Physicians for to cleanse the ulcer; which when the Patient useth, he shall lie on his back to keep them long in his mouth, so to relax the muscles of the *Larinx*; for thus the Medicin will fall by little and little alongst the coats of the Weazon, for if it should fall down in great quantity, it would be in danger to cause coughing. Cows, Asses, or Goats-milk with a little Honey, lest they should corrupt in the stomach, are very fit remedies for this purpose; but Womans milk exceeds the rest.

How *Eclegmata* must be swallowed.

But Sugar of Roses is to be preferred before all other Medicins, 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 cleansed ulcer, you must command the Patient to use emplastick, austere, and astringent Medicins, such as are *Terra sigillata*, *bolus armenus*, *hypocystis*, *Plantain*, *Knot-grass*, *Sumach*, *Acacia*, and the like, which the Patient shall use in his Broths and *Eclegmaes*, 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 Fever 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, whilest a Physician is sent for, to overcome this disease with more powerful and certain remedies.

The utility of Sugar of Roses in ulcerated or wounded Lungs.

CHAP.

CHAP. XXXII.

Of the differences, causes, signs, and cure of an Hective Fever.

The reason of the name.

A Hective Fever 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 Grecks *Hexeis*; both which the Latin word *Habitus* doth signifie.

The differences thereof.

There are three kinds, or rather degrees of this Fever. 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 destroys the solid parts themselves. For thus the flame of a Lamp first wastes the Oil, then the proper moisture of the Wick. Which being done, there is no hope of lighting it again, what store of Oil soever you pour upon it. This Fever very seldom breeds of it self, but commonly follows after some other.

The Causes.

Wherefore the causes of a Hective Fever, are sharp and burning Fevers not well cured, especially if their heat were not repressed with cooling Epithems applied to the heart and *Hypochondria*. If cold Water was not fitly drunk. It may also succeed a Diary Fever 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, Womb, Kidneys, Bladder, of the Guts *Jejunum* and *Colon*, and also of the other Guts, if the *Phlegmon* succeed some long *Diarrhœa*, *Lienteria*, or Bloudy-flux, whence a Consumption of the whole body, and at last a Hectick Fever, the heat becoming more acrid, the moisture of the body being consumed.

The Signs.

This kind of Fever, as it is most easily to be known, so is it most difficult to cure; the pulse in this Fever is hard, by reason of the driness of the Artery which is a solid part; and it is weak by reason of the debility of the vital 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 oftenness to supply that defect.

Why in hecticks the heat is more acrid after meat.

But for the pulse, it is a proper sign of this Fever, that one or two hours after meat the pulse feels stronger than usual; and then also there is a more acrid heat over all the Patients body. The heat of this flame lasts until the nourishment be distributed over all the Patients body; in which time the driness 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 moistned with water grows so hot, as it smoaks and boils up. At other times there is a perpetual equality of heat and pulse in smalness, faintness, obscurity, frequency, and hardness, without any exacerbation, so that the Patient cannot think himself to have a Fever, yea, he cannot complain of any thing, he feels no pain, which is another proper sign of an hectick Fever. The cause that the heat doth not shew it self is, it doth not possess the surface of the body, that is, the spirits and humours, but lies as buried in the earthy grosness of the solid parts. Yet if you hold your hand somewhat long, you shall at last perceive the heat more acrid and biting, the way being opened thereto by the skin, rarified by the gentle touch of the warm and temperate hand. Wherefore if at any time in these kind of Fevers the Patient feel any pain, and perceive himself troubled with an inequality and excess of heat, it is a sign that the hectick Fever is not simple, but conjoined with a putrid Fever, which causeth such inequality, as the heat doth more or less seize upon matter subject to putrefaction; for a hectick Fever of it self is void of all equality, unless it proceed from some external cause, as from meat. Certainly if an Hippocratick 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 Fever be a Disease, or else a Symptom. For if it be symptomatical, it cannot be cured as long as the Disease, the cause thereof, remains uncured; as if an ulcer of the Guts occasioned by a Bloudy-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, unless first the fistulous or dysenterick ulcer shall be cured; because the Disease feeds the Symptoms, as the Cause the Effect. But if it be a simple and essential hectick Fever, for that it hath its essence consisting in an hot and dry distemper, which is not fixed in the humours, but in the solid parts, all the counsel of the Physician must be to renew the body, but not to purge it; for onely the humours require purging, and not the defaults of the solid parts. Therefore the solid parts must be refrigerated and humected, which we may do by Medicins taken inwardly and applied outwardly.

The signs of a hectick joined with a putrid Fever.

The Cure.

A symptomatical hectick.

An essential hectick.

Things to be taken inwardly.

The things which may with good success be taken inwardly into the body for this purpose, are Medicinal 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 Medicinal 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 pass that they do not humect and cool them lightly and superficially, like the Medicins which have onely 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, Ducks-meat, or Water-lentil, Mallows, especially when the belly shall be bound. Some are Fruits, as Gourds, Cucumers, Apples, Prunes, Raisins, Sweet Almonds, and fresh or new Pine-Apple kernels; in the number of Seeds are the four greater and lesser cold Seeds, and these new, for their native humidity, the Seeds of Poppies, 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 days, after the first Concoction.

For

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 extreme 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 Water, and well cooked, hard Eggs eaten with the juice of Sorrel without Spices, Whitings and Stock-fiſh. 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 Feverith heat. But when the Patient languiſheth of a long hectick, he muſt feed upon meats of eaſie digeſtion, and theſe boiled rather then roaſted; for boiled meats humect more, and roaſted more eaſily turn into choler. Wherefore he may uſe to eat Veal, Kid, Capon, Pullet, boiled with refrigerating and humecting herbs; he may alſo uſe Barly-creams, Almond-milks, as alſo Bread crummed and moiſtned with Roſe-water, and boiled in a decoction of the four cold Seeds with Sugar of Roſes; for ſuch a Panada cools the Liver, and the habit of the whole body, and nouriſheth withall. The Teſticles, Wings, and Livers of young Cocks, as alſo Figs and Raiſins. But if the Patient at length begin to loath and grow weary of boiled meats, then let him uſe roaſt, but ſo that he cut away the burnt and dried part thereof, and feed onely on the inner part thereof, and that moiſtned in Roſe-water, the juice of Citrons, Oranges, or Pomegranates. Let him abſtain from Salt and dry Fiſhes, and chuſe ſuch Fiſhes as live in ſtony Waters, for the exercciſe they are forced to undergo in ſhunning the Rocks beaten upon by the Waves. Aſſes milk newly milked and ſeaſoned with a little Salt, Sugar, Honey or Fennel, 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 half a pint, is much commended; verily Womans milk is the more wholſom, 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 oft proceeds. Let your Milch Aſs be fed with Barly, Oats, Oak-leaves; 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 moiſtens 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.

The choice of meats.

How Aſſes milk muſt be uſed in a hectick.

Womans milk more wholeſom than Aſſes.

Theſe things which are to be outwardly applied, are inunctuous Baths, Epithems, Clyſters. Inunctions are divers, according to the various Indications of the parts whereto they are applied. For *Galen* anoints all the ſpine with cooling and moderate aſtringent things, as which may ſuffice to ſtrengthen the parts and hinder their waſting, and not let the tranſpiration; for if it ſhould be letted, the heat would become more acrid by ſuppreſſing the vapours. Oil of Roſes, Water-Lillies, Quinces, the mucilages of Gum-tragacanth and Arabick extracted into Water of Night-ſhade, with ſome ſmall quantity of Camphire, and a little Wax if need require: but on the contrary, the parts of the Breſt muſt be anointed with refrigerating and relaxing things; by refrigerating, I mean things which moderately cool, for cold is hurtful to the Breſt. But aſtringent things would hinder the motions of the Muſcles of the Cheſt, and cauſe a difficulty of breathing. Such inunctions may be made of Oil of Violets, Willows, of the Seeds of Lettuce, Poppies, Water-Lillies, mixing with them the Oil 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 Oils newly made give you not old, rancid and ſalted Oils, for ſo in ſtead of refrigerating, you ſhall heat the part; Wine, Honey, and Oil, acquire more heat by Age; in defect of convenient Oils, we may uſe Butter well waſhed in Violet and Night-ſhade 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.

Things to be outwardly applied.

A caution in the choice of Oils.

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 been boiled, will be ſufficient; or elſe not onely to moiſten, but alſo to acquire them a fairer and fuller habit, and then you may add 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, than 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 four 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 Eggs tempered with ſome Roſe-water and Sugar of Roſes in ſtead of Salt. Some four or five hours after, let him enter into the Bath, thoſe things which I have ſet down being obſerved. When he comes out of the Bath, let him be dried and gently rubbed with ſoft linnen cloths, and anointed, as I formerly preſcribed, then let him ſleep, if he can, for two or three hours in his bed: when he wakes, let him take ſome Priſan or ſome ſuch like thing, and then repeat his Bath after the aforeſaid manner. He ſhall uſe this Bath thrice in ten days. But if the Patient be ſubject to crudities of the ſtomach, ſo that he cannot ſit in the Bath without fear of ſwooning, and ſuch ſymptoms, his ſtomach muſt be ſtrengthened with Oil of Quinces, Wormwood and Maſtich, or elſe with a cruſt of Bread toaſted and ſteeped in Muſkadine, and ſtrewed over with the Powders of Roſes, Sanders, and ſo laid to the ſtomach, or behind near to the

The differences of Baths.

Why the Patients muſt not enter the Bath faſting.

How to prepare the body for the Bath.

Things ſtrengthening the Ventricle.

Epithems.

the 13. *vertebra* of the back, under which place Anatomy teaches that the mouth of the ſtomach lies. Epithems ſhall be applied to the Liver and Heart, to temper the too acrid heat of theſe parts, and correct the immoderate drineſs 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 Cucumers, of each three drams in the decoction, and mixed with much tempering with Oil of Violets, or of ſweet Almonds, is moſt excellent of all other. Let cloths be dipped and ſteeped in ſuch Epithems, and laid upon the part and renewed 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 dried 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 Oil of Violets or Water-Lillies.

What a flux happening in a hectick Fever indicates.

But becauſe there often happens very dangerous fluxes in a confirmed hectick Fever, which ſhew the decay of all the faculties of the body, and waſting of the corporeal 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 Fever frequently invades children by anger, great and long fear, or the too hot milk of the Nurſe, over-heating in the Sun, the uſe of Wine, and other ſuch like cauſes; they ſhall be kept in a hot and moiſt air, have another Nurſe, and be anointed with Oil of Violets; to conclude, you ſhall apply Medicins which are contrary to the morbifick cauſe.

CHAP. XXXIII.

Of the Wounds of the Epigaſtrium *and of the lower Belly.*

How children be cured.

Their differences.

THe Wounds of the lower Belly are ſometimes before, ſometimes behind, ſome onely touch the ſurface thereof, others enter in; ſome paſs 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 Veſſels, ſo that oft-times a great portion of the Kall falls forth. We know the Liver is wounded, when a great quantity of bloud comes forth of the Wound, when a pricking pain reaches even to the Sword-like griſle, to which the Liver adheres. Oft-times more choler is caſt up by Vomit, and the Patient lies on his Belly with more eaſe and content.

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 and 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 extreme 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 bloud, 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, bloud is piſſed forth with the Urin, and he hath a pain ſtretched to his groins and the regions of the Bladder and Teſticles.

Signs that the Kidneys 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; Bloud is made inſtead of Urin, or elſe the Urin is very bloudy, which alſo divers times comes forth at the Wound. When the Womb is wounded, the bloud breaks forth by the Privities, and the ſymptoms are like thoſe of the Bladder.

Signs that the Womb is wounded.

The Wounds of the Liver are deadly, for this part is the Work-houſe of the Bloud, 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 bloud not onely inwardly, but alſo outwardly, and conſequently a diſſipation of the ſpirits and ſtrength.

Prognoſticks. *Lib. 6. cap. 88.*

But the bloud which is ſhed inwardly amongſt the Bowels putrefies and corrupts, whence follows Pain, a Fever, 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 Veſſels run to the *Jejunum* or empty Gut, and it is of a very nervous and ſlender ſubſtance, and beſides it receives the cholerick humour from the bladder of the Gall. So alſo the Wounds of the Spleen, Kidneys, Ureters, Bladder, Womb, and Gall, are commonly deadly, but always ill, for that the actions of ſuch parts are neceſſary for life; beſides divers of theſe are without bloud and nervous, others of them receive the moiſt excrements of the whole body, and lie 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 air entering in amongſt the Bowels, greatly hurts them, as never uſed to the feeling thereof; add hereto the diſſipation of the ſpirits which much weakens the ſtrength. Neither can the filth of ſuch Wounds be waſted away according to the mind of the Chirurgeon, whereby it happens they divers times turn into Fiſtulaes, 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 and favour have recovered of Wounds paſſing quite through their bodies.

A Hiſtory.

I can bring as a witneſs the Steward of the Portugal Embaſſadour, whom I cured at *Melun* of a Wound made with a Sword ſo running through the body, that a great quantity of excrements came forth of the wounded Guts as he was a dreſſing, yet he recovered.

Not

Not long ago *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 days together, whereby you know the guts were wounded; and yet he was healed in twenty days. In like sort the wounds of the greater vessels are mortal, by reason of the great effusion of blood and spirits which ensues thereupon. Another History.

CHAP. XXXIV.

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 pass no further then the *Peritonæum* 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.

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 boisterously 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 easie 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, and 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 those which are faln out through the wound. But often in this case, the guts having taken cold by the encompassing air, 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 Camomil, Melilot, Aniseeds, and Fennel, applied 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 shall be dilated, that so the guts may return the more freely to their place. The cure of a wounded gut.

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 air, 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 putrifies, 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 its 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 better to let the kall thus bound to hang forth until 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, and so go along putting the needle from without inwards, and from within outwards, but so that you only take the musculous flesh and skin over it, and 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 incurable tumor after the wound is cicatrized on the outside. But that which we said before, according to *Galen*'s 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 bowels, the Chirurgeon shall not suffer them to be without medicines, as if they were desperate, but he shall spare neither labour nor care to dress them diligently. For doubtful hope is better than certain despair. The bladder, womb and right gut being wounded, detergent and agglutinative injections shall be put up by their proper passages. I have read nothing as yet in any Author of the wounds of the fat, for all of them refer the cure thereof to the wounds of the muscles. Yet I will say this by the way, that wounds of the fat, how deep soever they be, if they be only simple, may be dressed without putting in of any tent, but only dropping in some of my Balsam, and then laying upon it plaister of *Gratia Dei*, or some such like; for so they will heal in a short time. The cure when the kall falls out.

* *Hip. Aph.* 58. *sect.* 6.

The cure of the wounded fat.

Lib. 6. *Meth. cap.* 4.

CHAP. XXXV.

Of the Wounds of the Groins, Yard, and Testicles.

WHen the groins and neigbouring 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 near neighbours that oft-times they are all wounded with one blow. But for the wounds of the testicles and genital parts, because they are necessary instruments for the preserving the *Species* by generation of a succession of Individuals, and to keep all things quiet at home, therefore the Chirurgeon ought to be very diligent and careful 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 Thighs and Legs.

Why wounds of the inside o the thigh are oft-times deadly.

WOunds which have been received on the inside of the thighs, have often caused sudden death, if they have come to the vein *Sapbena*, or the great artery, or the nerves, the associates of these vessels. But when they are simple, there is nothing which may alter the usual manner of cure. Yet the Patient must be careful 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 fearful symptoms, as an inflammation, an abscess, from whence oft-times such abundance of matter issues forth, that the Patient falls into an *Atrophia* and Consumption. Wherefore such wounds and ulcers require a careful and industrious Chirurgeon, who may fitly make Incisions necessary for the corrupt parts, and 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 joynts, 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 a 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 endeavoured 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 judge it altogether necessary, that he use to go with Crutches for a good while after the wound is perfectly healed up.

The large tendon of the heel hard to consolidate.

CHAP. XXXVII.

Of the Wounds of the Nerves and nervous parts.

Differences drawn from things wounded.

THe continuity of the nervous parts is divers ways 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, cudgel, hammer, lance, bullet out of a Gun or Cross-bow; by the biting of greater teeth; or the pricking of some sharp thing, as a needle, bodkin, pen-knife, arrow, splinter; or the puncture of some venemous thing, as of a Sea-dragon; or the edge 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 broad-ways; some cut the part quite asunder, others only a portion thereof. The symptoms which follow upon such wounds are, vehement pain, and defluxion, inflammation, abscess, feaver, *delirium*, swooning, convulsion, gangrene, sphacel; whence often death ensues by reason of that sympathy which all the nervous parts have with the brain.

Their symptoms.

Why a puncture of a nerve is deadly.

Amongst all the wounds of the nervous parts, there is none more to be feared than a puncture, or prick, nor any which causeth more cruel and dangerous symptoms. 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 symptoms; 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 and contracting it self towards the original, 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.

CHAP.

CHAP. XXXVIII.

Of the cure of Wounds of the nervous parts.

IT is the ancient Doctrine of the ancient Phyſicians, that the wounds of the nervous parts ſhould not preſently be agglutinated (which notwithſtanding the general 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 the nervous parts indicated contrary to the general cure of wounds.

That cure is in freſh memory which I performed upon Monſieur *le Coeq*, a Proctor of the Spiritual Court, who dwelt in our *Ladies-ſtreet*; he gathering and binding up ſome looſe Papers, run a Pen-knife 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 Balſom 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 ſymptom 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 habit of men; for this manner of curing will 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 applied to punctures, and to thoſe nerves which are not wholly laid open, ought to be far more powerful, ſharp and 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 particles, the 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. vin. & olei veteris an.* ℥ i. *Aquæ vitæ parum.* Or R *olei Terebinth.* ℥ i. *Aqua vitæ* ʒ i. *Euphor.* ℥ ß. Or, R *radices Draconiæ, Briioniæ, Valerianæ & Gentianæ exſiccatæ, & in pulverem redactas, miſce cum decocto centauri, aut oleo aut axungia veteri*; drop hereof warm into the wound as much as ſhall ſuffice. Or elſe put ſome Hogs, Gooſe, Capons, or Bears Greaſe, old Oyl, Oyl of Lilies, or the like, to *Galbanum*, pure Rozin, *opopanax* diſſolved in *Aqua vitæ* and ſtrong Vinegar. Or, R *olei hypericonis ſambuci, & de euphorbio an.* ℥ i. *Sulphuris vivi ſubtiliter pulveriſati* ʒ ß, *gummi ammoni. bdellii an.* ʒ ii. *Aceti boni* ℥ ij. *Vermium terreſt. præparat.* ℥ i *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* ℥ i. *Terebinth. venet.* ℥ ß, *diachylonis albi cum gummi*, ʒ x. *ammoniac. bdellii in aceto diſſolutorum, an.* ʒ ij. *reſin. pini gum. elemi, picis navalis an.* ʒ v. *ceræ quod ſufficit, fiat ceratum* *ſatis molle.* We muſt uſe ſome whiles one, ſome whiles another of theſe medicines in punctures of the nerves with choice and judgment, according to their conditions, manner, depth, and the temperaments and habits of the wounded bodies. But if the pain yield 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 pour into it ſcalding Oyl, and ſhall touch three or four times not only the ſurface of the wound, but the bottom thereof with a rag dipped therein and tied to the end of *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 cotton 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 always aſſociated with much pain, the pain ceaſes by applying an Eſcharotick, the powder of Alum or Mercury, or *Ægyptiacum* made ſomewhat more ſtrong than uſual. That the young Chirurgeon may be more ready for this practice and the uſe of the former medicines, I have thought good to inſert the following Hiſtory, both for the lateneſs of the thing, and pleaſing memory of the moſt laudable Prince. Medicines fit for wounds of the nerves. What wounds of the nerves muſt be burnt. A certain Anodyne in pain of the teeth. Why Eſcharoticks muſt be uſed to ſpreading ulcers.

Charles the ninth, the French King, being ſick of a Feaver, Monſieur *Chapellan* and *Caſtellan* his Phyſicians 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 inſtead of a vein, the King cried out, that he felt a mighty pain in that place. Then I bid, that the ligature ſhould ſtreight-ways be looſed, otherwiſe the arm would preſently be much ſwelled. But he going ſlowly about it, behold the arm began to ſwell 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, and then I wrapped all 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 ſhouldbe covered with a plaiſter of *Diacalcitheos* diſſolved in Vinegar and A hiſtory. A famous Hiſtory.

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 bottom 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 actual heat. Furthermore, 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 attriction would ſerve to ſtrengthen the muſcles, and to preſs out and repel 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 Phyſicians both in word and deed, the pain was mitigated. But the humor ſtaid in the part, for the diſſolving and drying whereof, this following remedy was uſed. ℞ *far. hordei & orobi an.* ʒ 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 laſt, after three 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 yield 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 yield to the preſcribed remedies, either to pour in ſcalding Oyl, or elſe to cut the ſinew quite aſunder.

A diſcuſſing and drying cataplaſm.

A Hiſtory.

For the late and ſad memory of Mrs *Courtin* dwelling in the Street of *Holy-Croſs*, was in our minds, who of a vein not well opened in her arm fell into a Gangrene and total mortification of that whole part, of which ſhe died, becauſe ſhe was not dreſſed with the formerly mentioned medicines. Yet we muſt abſtain from theſe two powerful remedies, when the pricked nerve ſhall lye bare, for elſe the pain would be increaſed, and more grievous ſymptoms follow. Wherefore as I formerly wiſhed, more mild medicines muſt be applied, which may dry up the ſerous humor without biting acrimony; as ℞ *Terebinth. venet. in aq. roſ. lota* ℥ ij. *Boli armeni ſubtiliter pulveriſati,* ʒ ij. *Incorporentur ſimul.* Our Balſom alſo is excellent in this caſe, and this of *Vigo*'s which follows. ℞ *Olei roſar. omphacini* ℥ i ß. *Olei de terebinth.* ʒ iij. *ſuci plantag.* ℥ ß. *Semin. hyperici nis aliquantulum contriti.* ß. *Tutiæ præpar.* ʒ iij. *Calcis decies lotæ cum aquâ plantagin.* ʒ ij. *antimonii* ʒ i. *ſevi hercini, & vitulini, an.* ℥ v. *vermium terreſtrium cum vino lotorum* ℥ i ß. *Bulliant omnia ſimul dempta tutia in cyatho decoctionis hordei, ad conſumptionem aquæ & vini, colentur rurſumq; igni admoveantur, addendo tutiam, & fiat linimentum cum cera albâ, &* ℥ ß. *Croci.* This liniment aſſwages pains, and covers the bared nerves with fleſh. This cure of punctured nerves, may with choice and judgment, and obſerving the proportion of the parts, be transferred to the pricked tendons and membranes. But take this as a general and common rule, that all nervous bodies howſoever hurt, are to be comforted by anointing them with hot Oyls, ſuch as the Oyl of Bays, Lilies, of Worms, Sage, or ſome other ſuch like remedy being applied to their originals and more notable paſſages; as to the original of the ſpinal marrow, the arm-pits and groins. Neither do I think fit in this place to omit an effect 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 horſe-back, 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 Coach-mans whip; above the heel, where the tendon is broken, the depreſſed cavity may be felt with your finger, there is a 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 medicines applied to the part affected in the beginning of the diſeaſe, for fear of more grievous ſymptoms, 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 foretel 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 adjoyned, nor being adjoyned, united.

An Anodyne and Sarcotick Balſom.

A general 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 always 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 ſymptoms, eſpecially if the wound poſſeſs an internal, or, as they term it, a domeſtick part of them; as for example, the arm-pits, 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, ſharp pain, and other malignant ſymptoms; 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 joyned with a ſuture, leaving an orifice in the lower part, by which the quitture may paſs forth. This following powder of *Vigo*'s deſcription muſt be ſtrewed upon the ſuture. ℞ *Thuris, ſang. draconis, boli armen. terræ ſigill. an.* ʒ ij. *Aloes, maſtich. an.* ℥ i. *Fiat pulvis ſubtilis.* And then the joynt muſt be wrapped about with a repercuſſive medicine compoſed of the whites of Eggs, a little oyl of Roſes, Bole, Maſtich, and Barley flower. If it be needful to uſe a Tent, let it be ſhort, and according to the wound

The cure.

thick,

thick, left it cauſe pain, and moreover let it be anointed with the yolk of an Egg, oyl of Roſes, waſhed Turpentine and a little Saffron. But if the wound be more ſhort and narrow, it ſhall 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 medicines are good, as this following Cataplaſm. *℞ furfur. macri, farin. hordei, & fabarum an.* ℥ iiij. *Florum chamæ. & melil. an.* m. ß *terebinth.* ℥ iij. *mellis communis* ℥ ij. *ol. myrt.* ℥ i. *Oxymelitis, 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, ſtrengthning and drying quality, and thereby aſſwaging pain, and hindering the defluxion of humors. This following medicine is aſtringent and agglutinative. *℞ terebinth. venet.* ℥ ij. *aq. vitæ parum, pulveris maſtich. aloes, myrrhæ, boli armen. an.* ℈ ij. And alſo our Balſam will be good in this caſe, if ſo be that you add hereto ſo much powder which dries without Acrimony, as occaſion ſhall ſerve: I admoniſhed you before to take heed of cold, and now again; for it is hurtful to all wounds and ulcers, but eſpecially to theſe of the nervous parts: Hence it is that many die of ſmall 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 natural 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 Egg, and mucous, and ſometimes a very thin water, all which favour 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 radical moiſture or juyce flows, whence alſo a *Callus* proceeds in broken bones. Now this ſame mucous, and albugineous humor, flow, and as it were frozen, flowing from the wounded joynts, ſhews the cold diſtemper of the parts, which cauſe pain, not to be overcome by medicines 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 actual heat helps Nature to concoct and diſcuſs the ſuperfluous humor impact in the joynts, and ſtrengthens them; both which are very neceſſary, becauſe the natural heat of the joynts is ſo infirm that it can ſcarce actuate the medicine, unleſs it be helped with medicines actually hot. Neither muſt the Chirurgeon have the leaſt care of the figure and poſture of the part, for a vicious poſture increaſes ill ſymptoms, 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 fore-part of the ſhoulder be wounded, a great boulſter muſt be under the arm-pit, 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 ways ever and anon; for if that be omitted or negligently done, when it is cicatrized, then it will be more ſtiff 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 ſhall 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 joynts 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 ſtrait 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 be healed, it remain half ſhut, no great inconveniency will follow thereon: For ſo he may uſe his hand divers ways to his Sword, Pike, Bridle, and in any thing elſe. If the joynts 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 applied 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 ſtrait out, if the Patient deſire not to be lame. When the joynts 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.

An aſtringent and drying Cataplaſm.

Aphor. 20 *ſect.* 5.

What matter uſually flows from wounds of the joynts.

Why things actually hot muſt be applied to the wounded joynts.

Of the ſite and poſture of wounded joynts.

CHAP. XL.

Of the Wounds of the Ligaments.

THe wounds of the Ligaments, beſides the common manner of curing thoſe of the Nerves, have nothing peculiar, but that they require more powerful medicines, for their agglutination, deſiccation and conſolidating; both becauſe the ligamental parts are harder and drier, and alſo for that they are void of ſenſe. Therefore the foreſaid cure of nerves and joynts may be uſed for theſe wounds: For the medicines in both are of the ſame kind; but here they ought to be 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 thanks to God the Author and giver of all good, for the happy proceſs of our labours: And let us pray that that which remains may be brought to a happy end, and ſecure for the health and ſafety of good people.

Ligaments more dry than nerves, and without ſenſe.

The end of the Tenth Book.

BOOK XI.

Of Wounds made by Gunshot, other fiery Engines, and all sorts of Weapons.

The PREFACE.

I Have thought good here to premise my opinion of the original, increase, 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 junkets, to our following Banquet so much savouring of Gunpowder. For thus it shall be known to all whence Guns had their original, and how many habits and shapes they have acquired from poor and obscure beginnings; and lastly, how hurtful to mankind the use of them is.

Lib. 2. de Invent. rerum.

Polydore Virgil *writes, that a German 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 a Mortar covered with a tile 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 suddenly catching fire, casts the stone or tile which covered the Mortar up on high; he stood amazed at the novelty and strange effect of the thing, and withal 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, *this Invention must have been of greater antiquity; for it is read in the Chronicles of* Alphonsus XI. *King of* Castile, *who subdued the Isles* Argenires, *that when he besieged the chief Town, in the year of our Lord,* 1343. *the besieged Moors 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* Sivil, *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 now they have.*

Cap. 8. prim. par. vardill.

I think the Deviser of this deadly Engin hath this for his recompence, that his name should be hidden by the darkness of perpetual ignorance, as not meriting for this his most pernitious 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 German the Inventer of this Warlike Engine was by Profession a Monk and Philosopher, or Alchymist, born at* Friburg, *and nam'd* Constantine Anclzen. *However it was, this kind of Engine was called* Bombarda (i.) *a Gun, from that noise it makes, which the Greeks and Latins according to the sound call* Bombus; *then in the following ages, time, art and mans maliciousness, added much to this rude and unpolish'd invention. For first for the matter; Brass and Copper, Metals far more tractable, fusible, and less subject to rust, came as supplies to Iron. Then for the form; that rude and undigested Barrel or Mortar-like mass, hath undergone many forms 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 ruine of mankind; when as the first and rude Mortars seemed not to be so nimbly traversed, nor sufficiently cruel for our destruction by the only casting forth of Iron and fire. Hence sprung these horrible Monsters of Canons, double Canons, Bastards, Muskets, Field-pieces; hence these cruel and furious Beasts, Culverins, Serpentines, Basilisques, Sakers, 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 wisdom 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 harmful and hateful to mankind, such as Serpents, Snakes, and Basilisques. 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 cruel slaughter of men; and that by only hearing them named we might detest and abhor them, as pernicious enemies of our lives. I let pass other Engines of this Off-spring, being for their quantity small, but so much the more pernicious and harmful, for that they nearer assail our lives, nay trayterously, and forthwith seise upon us not thinking nor fearing any such thing; so that we can scarce have any means of escape; such as Pistols and other small Hand-guns, which for shortness you may carry in your pocket, and so privily and suddenly taking them forth oppress the careless and secure. Fowling-pieces which men usually carry upon their shoulders, are of the middle rank of these Engines, as also Muskets and Calceveres, which you cannot well 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 they call in Latin by a general name* Sclopus, *in imitation of the sound, and the Italians who term it* Sclopetere; *the French call it* Harquebuse, *a word likewise borrowed from the Italians, by reason of the touch-hole by which you give fire to the Piece, for the Italians call a hole* Buzio. *It is termed* Arcus (i.) *a Bow, for that at this present it holds the same place in Martial affairs, as the Bow did of old; and*

Who the Inventer of Guns.

The reason of the name.

The danger of Pistols.

and as the Archers formerly, so at this day the Musketiers are placed in front. From the same wretched Shop, and Magazine of Cruelty, are all sorts of Mines, Countermines, Ports of fire, Traines, Fiery Arrowes, Lances, Cross-bows, Barrels, Balls of Fire, burning Fagots, Granats, and all such fiery Engines and Inventions, which closely stuffed with fuel 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 needless 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 harness, no water being sufficiently powerful to restrain and quench the raging and wasting violence of such fire cruelly spreading over the body and bowels. So it was not sufficient to have Arms, Iron, and Fire to mans destruction, unless also that the stroke might be more speedy, we had furnished them, as it were with wings, so to fly more hastily to our own perdition, furnishing Sathe-bearing 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 Battels, as Bows, Darts, Cross-bows, Slings; or in the assault of Cities, and shaking or overturning their Walls, as Rams, Horses, Wooden-towers, Slings, and such like; they seem to me certain childish sports and games made only in imitation of the former. For these modern Inventions are such as easily exceed all the best appointed and cruel 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 fearful than Thunder or Lightning? and yet the hurtfulness of Thunder is almost nothing to the cruelty of these infernal Engines; which may easily appear by comparing together both their effects. Man alone of all Creatures is not always killed by being touched with Thunder; but it immediately killeth all other things which are subject to be touch'd therewith. Nature bestowing this honour upon him, seeing so many Creatures exceed him in strength: For all things lye contrary to man; and man, unless he be overthrown with it, doth not die thereof. But these fire-spitting Engines do no more spare man, than they do other Creatures, and kill without difference from whence soever they come, whither soever they are carried, and how-soever 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 fearful thought the deeper Caves the 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 modern times. Wherefore Tiberius Cæsar, *otherwise a contemner of God and Religion, as he who indued with the Mathematical Sciences, thought all things governed by Fate, yet because he exceedingly feared Thunder, he always carried a Laurel Wreath about his neck when the air was troubled, for that this kind of leaf is reported not to be touched with Thunder. Some report that he made him Tents of Seals skins, because it toucheth not this kind of Creature of all those things that live in the Sea, as neither the Eagle amongst Birds, which for that is feigned to be* Jove's *Squire. But on the contrary, Charms, the victorious Bay, the Seal, or Sea-calf, 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 Canons 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 agitation 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 seldom 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 soever it receives; which thing keeps* Scythia *and the cold Countreys 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 vent 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 report. The Thunder and Lightning commonly gives but one blow or stroke, and that commonly strikes but one man of a multitude: But one great Canon at one shot may spoil and kill a hundred men. Thunder, as a thing natural, falls by chance, one while upon a high Oak, another while upon the top of a Mountain, and sometimes on some lofty Tower, but seldom upon Man. But this hellish Engine, tempered by the malice and guidance of man, assails 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, foretels the storm at hand; but, which is the chief mischief, this infernal Engine 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 debort Kings from their use, or else labour by writing and operation to apply fit medicines to wounds made by these Engines. 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 amiss, (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 minds of divers; for that, unless these be taken away, the essence and nature of the whole disease cannot be understood, nor a fitting remedy applied by him which is ignorant of the disease.*

A comparison of the ancient Weapons with the modern.

Pliny Lib. 2. cap. 59.

Plin. lib. 2. cap. 52.

Sueton. in Tiber. vit.

The wondrous force of great Ordnance.

Plin. lib. 2. cap. 50.

The first Discourse which is dedicated to the Reader, refels and condemns, 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 the order of curing which is performed by Suppuratives, 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 poyson, 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

The first Discourse wherein Wounds made by Gunshot, are freed from being burnt, or cauterized, according to Vigo's *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 Alps, under the Government and Leading of *Annas* of *Montmorancy* High Constable of *France*, both that he might relieve *Turin* with Victuals, Souldiers, and all things needful, as also to recover the Cities of that Province taken by the Marquis of *Guast* General of the Emperors Forces. I was in the Kings Army the Chirurgeon of Monsieur of *Montejan* General 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 oyl 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 poured 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 Oyl, at the first dressing, 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 egg, 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 wounds, whom I had not dressed with the scalding Oyl. 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 tumefied; but on the contrary, the others that were burnt with the scalding Oyl were feaverish, tormented with much pain, and the parts about their wounds were swoln. When I had many times tried 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 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 years 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 successful to his Patients; yet could I not obtain it. It fell out a small while after that the Marshal of *Montejan* the Kings Lieutenant General there in *Piedmont* died; 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 Whelps, one pound of Earth-worms, two pounds of Oyl of Lilies, six ounces of Venice Turpentine, and one ounce of *Aqua vitæ*. In my presence he boiled the Whelps put alive into that Oyl, until the flesh came from the bones; then presently he put in the Worms, which he had first killed in White-wine, that they might so be cleansed from the earthy dross wherewith they are usually repleat, and then he boiled them in the same Oyl so long, till they became dry, and had spent all their juyce therein: Then he strained it through a towel without much pressing; and added the Turpentine to it, and lastly *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, well 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 Gunpowder. Then I affirmed to him that Gunpower did not participate any thing of poyson, for that none of those things whereof it is compounded are poysonous; which reason ought to free the whole composition from suspicion of poyson. And that experience confirmed this reason; for I had seen many Souldiers, who would drink a great quantity of this powder with Wine, because they were perswaded, that this drink would free them from malign symptoms when they were wounded; yet I give no credit to this perswasion; and lastly, for that many without any harm, strewed this powder 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 Gunpowder, I observed no special nor peculiar remedy, which might make their cure different from other combustions. To which purpose I related this insuing History.

Lib. 1. de vulner. cap. 8.

What chance may do in finding out of remedies.

The description of Oyl of Whelps.

Gunpowder not poysonous.

Bullets shot out of a Gun do not burn.

A History.

One of the Marshal of *Montejan* his Kitchin-boys, fell by chance into a Caldron of Oyl, being even

even almost boiling 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 medicines 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 blistering in Burns or Scalds.

It fell out a while after, that a *German* of *Montejan* his Guard had his Flasque full of Gunpowder 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 medicines usually applied to Burns. At the second dressing I observed the part dressed with Onions quite free from blisters and excoriation, the other being troubled with both; whereby I gave credit to the medicine. Besides also, I lastly told him this, that I had observed, that was the readiest way 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 hurtful 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 learn'd many things from most expert Chirurgeons, but more from all learned Physicians, whose familiarity and favour for that purpose I always laboured to acquire with all diligence and honest arts; that so I might become more learned and skilful 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 have seen any thing in this kind of operation, either by study, or experience in Wars, have not thought that wounds made by Gunshot ought to be dressed at the first with suppurative medicines, and not with scalding and caustick Oyl. 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 pieces those things which resist, not only where it touches, but further also, through the violence of the blow, therefore it causeth many and grievous symptoms 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; and 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 weapons; 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 Gunpowder, 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.

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 thighs with a Pistol, the bone being not hurt nor touched; and yet the two and thirtieth 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* Ambassador, *Francis Brigart*, and *John Alting*, Doctors of Physick, as also *James Guillemeau*, the Kings Chirurgeon, and *Giles Buzet* a *Scottish* Chirurgeon, who all of them wondred that this Gentleman was so soon healed, no acrid medicine being applied. This I have thought good to recite and set down, that the Readers may understand, that I for thirty years ago had found the way to cure wounds made by Gunshot, without scalding Oyl, or any other, more acrid medicine; unless by accident the illness of the Patients bodies, and of the air, caused any malign symptoms, which might require such remedies besides the regular and ordinary way of curing, which shall be more amply treated of in the following Discourse. A History. 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* Rouen, *inquired of me concerning Wounds made by Gunshot.*

FOr that it pleased your Majesty one day, together with the Queen-Mother, the Prince of *Rock upon Yon*, and many other Noblemen 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 died, or scarce, 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 determine to publish concerning The occasion of writing this Discourse.

wounds

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* II. *Charles* IX. 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 marvel, 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 Gunpowder, or mixed with the Bullets whilſt they are tempered or caſt. Yet for all this, if they will courteouſly and patiently weigh my Reaſons, they ſhall either think as I do, or at leaſt ſhall judge this my endeavour and pains, taken for publick 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 Phyſicians, and alſo by certain experiments of my own, and other Chirurgeons, that the malignity and contumacy which we frequently meet withal in curing wounds made by Gunſhot, is not to be attributed either to the poyſon carried into the body by the Gunpowder or Bullet, nor to burning imprinted in the wounded part by Gunpowder. 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 Gunpowder: Neither, if there ſhould be any, could it empoyſon the bodies of ſuch as are wounded. Which that we may the more eaſily perform, we muſt examine the compoſition of ſuch powder, 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 argument of this Diſcourſe.

Gunpowder is not poyſonous.

The Simples which enter the compoſition of Gunpowder 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 drineſs, and a certain ſubtlety of ſubſtance, by means whereof it fires ſo ſuddenly, even as Tinder. Sulphur or Brimſtone is hot and dry, but not in the higheſt degree; it is often an oily and 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 are Aſthmatick, troubled with the cough, ſpit up purulent matter, and are troubled with the yellow Jaundiſe. But *Galen* applies it outwardly to ſuch as are bitten by venemous Beaſts, to Scabs, Tetters and Leproſies. For the *Aqua vitæ*, it is of ſo tenuious a ſubſtance, that it preſently vanitheth into the air, and alſo very many drink it, and it is without any harm uſed in trictions of the exterior parts of the body. Whence you may gather, that this powder is free from all manner of poyſon, ſeeing thoſe things whereof it conſiſts and is compoſed, want all ſuſpicion thereof. Therefore the German Horſe-men, when they are wounded with ſhot, fear not to drink off cheerfully half an ounce of Gunpowder diſſolved in Wine; hence perſwading themſelves freed from ſuch malign ſymptoms as uſually happen upon ſuch wounds; wherein whether they do right or wrong, I do not here determine. The ſame thing many French Souldiers forced by no neceſſity, but only to ſhew themſelves more couragious, alſo do without any harm; but divers with good ſucceſs uſe to ſtrew it upon Ulcers, ſo to dry them. Now to come to thoſe, who think that the venenate quality of wounds made by Gunſhot, ſprings not from the powder, 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 powerful 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 Towns-men in the ſiege of *Rouen*, were free from all poyſon; and yet for all that, they of the Town thought they were all poyſoned, when they found the wounds made by them, to be uncurable and deadly. Now on the other ſide, the Towns-men were falſly ſuſpected guilty of the ſame crime by the Kings Army, when as they perceived all the Chirurgeons labour in curing wounds made by the bullets ſhot from *Rouen*, 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 among Phyſicians, 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, and the corruption of meats and drinks. For by theſe cauſes wounds acquire an evil nature, and become leſs yielding to medicines. Now we have by theſe reaſons convinced of errour that opinion which held wounds made by Gunſhot for poyſonous: Let us now come to overthrow that which is held concerning their combuſtion.

Of what it is made.

Lib. 5. cap. 73. Lib. ſimp. cap. 36.

Bullets cannot be poyſoned.

As *Galen* notes *ad ſent. 20. & 21. ſect. 2. lib. 3. Epid.*

Firſt, it can ſcarce 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 will pierce through Armour and the whole body beſides, and yet remain whole, or but a little diminiſh'd. 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 barrel of Gunpowder, would preſently ſet it all on fire, if the bullet ſhould acquire ſuch heat by the ſhooting, but it is not ſo. For if any time the powder be fired

Woundsmade by Gunſhot are not burnt.

by

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 oppose or meets therewith, whence sparks of fire proceeding as from a flint, the powder 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 Wax, 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 always 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 pott, 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 are flesh contused and torn by the violence of the bullet beguiles them; which presently putrefying, and 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 powder from all suspicion of poyson, and the bullet from all thought of burning; yet there are many who insisting upon Philosophical Arguments raise new stirs. For (say they) the discharging a piece of Ordnance 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 Canon 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 falls 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 several 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 and forcible matter, like as Whirlwinds have. The third, for that it consists of a more terrestrial matter, burns what it touches, leaving behind it the impression of the burning. Also I know that Lightning is of a pestilent and stinking nature, occasioned by the grossness and viscidity of the matter whereof it is; which matter taking fire, sends forth so loathsom and odious a smell, 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 to 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 alike 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, and oft-times of a stone generated in them, which is therefore termed, 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 yield that the matter of 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 shatter in sunder all that withstand 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 tenuious matter, whose nature (as *Seneca* saith) we must not doubt to be divine, if but for this reason, that they will melt gold and silver, not harming the purse; a sword, not hurting the scabbard; the head of a lance, not burning the wood, and shed wine, not breaking the vessel. According to which decree I can grant, that these Lightnings which break in sunder, melt, and dissipate, and perform other effects so full of admiration, are like in substance to the shot of great Ordnance; but not those which carry with them fire and flame.

In proof whereof there comes into my mind a 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 Canon bullet, sliding close by their ears, fain down for dead, so that their members becoming livid and black, they have died by a Gangrene ensuing thereupon. These and such effects are like the effects of Lightning which we lately mentioned, and yet they bear no sign nor mark of poyson. From whence I dare now boldly conclude, that wounds made by Gunshot are neither poysoned, nor burnt. But seeing the danger of such wounds in these last Civil-wars hath been so great, universal, and deadly to so many worthy personages and valiant men, what then may have been the cause thereof, if it were neither cumbustion, nor the venenate quality of the wound? This must we therefore now insist upon and somewhat hardily explain. Those who have spent all their time in the learning and searching out the mysteries of natural Philosophy, would have all men think and believe, that the four Elements have such mutual sympathy, that they may be changed each into other; so that they not only undergo the alterations of the first qualities which are heat, coldness, driness and moisture, but also the mutati-

The reason why wounds made by Gunshot look black.

The reasons of our adversaries refelled. *Quæst. nat. l. 2. cap. 49.*

The stinking smell of Lightning.

Lib. 2. cap. 49.

The wonderful nature of some Lightning.

A History.

Why the wounds made by Gunshot some few years agone were so deadly.

The cause of the transmutation of the Elements.

on 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 four first bodies have in their common matter enjoyed the contrary and fighting, yet first and principal, qualities of all.

* These Bellows here mentioned by the Author, are Balls made of Brass in form of a Pear, with a very small 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 will be exceedingly rarified, which by putting them presently into water will be condensate as much, & so will draw in the water to supply the place, *ne detur vacuum*. Then put them into fire, and it again rarifying the water into air will make them yield a strong continued and forcible blast. The cause of the report and blow of a Canon.

Whereof we have an example in the * Ball-bellows brought out of *Germany*, which are made of brass, 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 assoon 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 rarefaction, requires a large place, neither can it now be contained in the narrow rinns, or skins of the Chesnut, wherein it was formerly kept. Just after the same manner Gunpowder being fired, turns into a far greater proportion of air according to the truth of that Philosophical 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 Piece, wherein the powder 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, spoils 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 die 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 powder is once fired, it removes and shakes even Mountains of earth.

A History.

In the year of our Lord, 1562. a quantity of this powder which was not very great, taking fire by accident in the Arcenal of *Paris*, caused such a tempest that the whole City shook therewith, but it quite overturned divers of the neighbouring houses, and shook off the tiles and broke the windows of those which were further off; and to conclude, like a storm 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 Gunpowder was turned. Just 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 overturns 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 over-turned by an Earthquake. I omit the great blusterings of the winds striving in the cavities of the earth, which represent to such as hear 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 Canons. 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 bowels appointed by nature, and whether we sleep, wake, or what else soever we do, we continual draw in and breath it out. Through which occasion, *Hippocrates* calls it Divine, for that breathing through this mundane Orb, 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 Physicians 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 four Seasons of the year; for in Summer the air being hot and dry, heats and dries 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 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 scarce 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 bowels the qualities of that wind which is then prevalent. Whence we read in *Hippocrates*, that changes of times, whether they happen by different winds, or vicissitude of Seasons, chiefly bring diseases; for northerly winds do condense, and strenghten our bodies, and make them active, well coloured and during, by refuscitating 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 harm, who are otherwise ranked among the most active people of *France*. But if we would make a comparison of the Seasons, and Constitutions of the year

The cause of an Earthquake.

How the air becomes hurtful.

Aphor. 17. *sect.* 3.

by

by *Hippocrates* Decree, Draughts are more wholesome and less deadly than rains; I judge, for that too much humidity is the mother of putrefaction, as you may learn by those 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 hour; and such Ulcers as in other places are easily and quickly healed, do there by the conflux and collection of matter become inveterate and contumacious. Therefore as when the seasons of the year successively fall out agreeable to their nature, and 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 decays, 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 usual 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 natural Philosophy and Astrology, who will not think but that the causes of the malignity and contumacy of those diseases which have so long afflicted all *France*, are 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 Catarrhs, Coughs, and heavinesses of the head? So many Pleurisies, Tumors, Small-poxes, Measles and Itches, not admitting of digestion and remedies prescribed by Art? Whence have we had so many venemous Creatures, as Toads, Grashoppers, Caterpillers, Spiders, Wasps, Hornets, Beetles, Snails, Vipers, Snakes, Lizards, Scorpions, and Efts or Neuts, unless from excessive putrefaction which the humidity of the air, our native heat being liquid and dull, hath caused in us, and the whole Kingdom 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 the Physicians, either for prevention of future, or cure of present diseases. Whence it comes to pass 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 hapned with loss of substance could be scarce healed or united, because of the depraved nature of the blood. For, so the wounds and ulcers of those 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 juyce, 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 marvel was it, if in these late Civil Wars, the wounds which were for their quantity small, for the condition of the wounded part 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 denles the wounds by inspiration and exspiration, 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 scarce 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 those of the common Souldiers. And the corruption was such, that if any chanced to be undrest for one day, which sometimes hapned amongst such a multitude of wounded persons, the next day the wound would be full of Worms. Besides also, which furthermore argues a great putrefaction of humors, many had abscesses in parts opposite to their wounds, as in their left knee, when as the right shoulder was wounded; in the left arm, when as the right leg was hurt. Which I remember befel the King of *Navarre*, the Duke of *Nevers*, the Lord *Rendan*, and divers others. For all men had Nature so over-charged 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 Bowels were purulent, and hence it was that the Patients by reason of vapours sent from them to the heart, were troubled with continual Feavers. But the liver and all the veinous parts being polluted, and 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, 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 great *Hippocrates*, who commands to bring all contused wounds to suppuration, that so they may be healed, we endeavoured to cure with such medicines wounds made with Gunshot, and therefore contused; who can rightly be angry with us, if we performed it not so well, by reason of those 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 medicines; so long turning aside from the cure of the disease, until we had orecome the symptoms 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.

Flesh quickly putrefies in maritime places.

In what bodies Ulcers and wounds are not easily cured.

An argument of great putrefaction of the humors.

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.

A division of wounds from the variety of the wounded parts.

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 vessels, 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, scarce 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 medicines 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 those reasons we have formerly handled at large. But rather let him judge 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 counsel of such Physicians as were there overseers of the cure.

From the difference of bullets.

Wounds made by Gunshot are usually round.

CHAP. II.

Of the signs of Wounds made by Gunshot.

Signs of wounds from their figure.

WOunds made by Gunshot are known by their figure, which is usually round; by their colour, as when the native colour of the part decays, and instead 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 fain upon it; by the small quantity of blood which issues out thereat, for when the parts are contused, within some small while after the stroke they swell up, so that they will scarce 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 without 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, and 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 unnatural heat seises upon it. Hitherto also tend an universal or particular repletion of ill humors, chiefly if the wounds possess the nervous parts, as the joynts. 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.

From their colour.

From the feeling of 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.

Strange bodies must first be pulled forth.

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, 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 principal 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 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, left you put the Patient to pain; yet oftentimes you shall scarce by this means find the Bullet. As it happened to the Marshal of *Brissac* in the Siege of *Perpignan*, who was wounded in his right shoulder with a bullet, which the Chirur-

The manner how to draw them forth.

geons

geons thought to have entered into the capacity of his body. But I, willing 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 wounds, and the rest which I suspected; as also by the swelling, hardness, pain and blackness of the part, which was the lower part of the shoulder near unto the eighth or ninth spondil 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 believe the judgment of your fingers, than of your Probe.

CHAP. IV.

A Description of fit Instruments to draw forth Bullets and other strange Bodies.

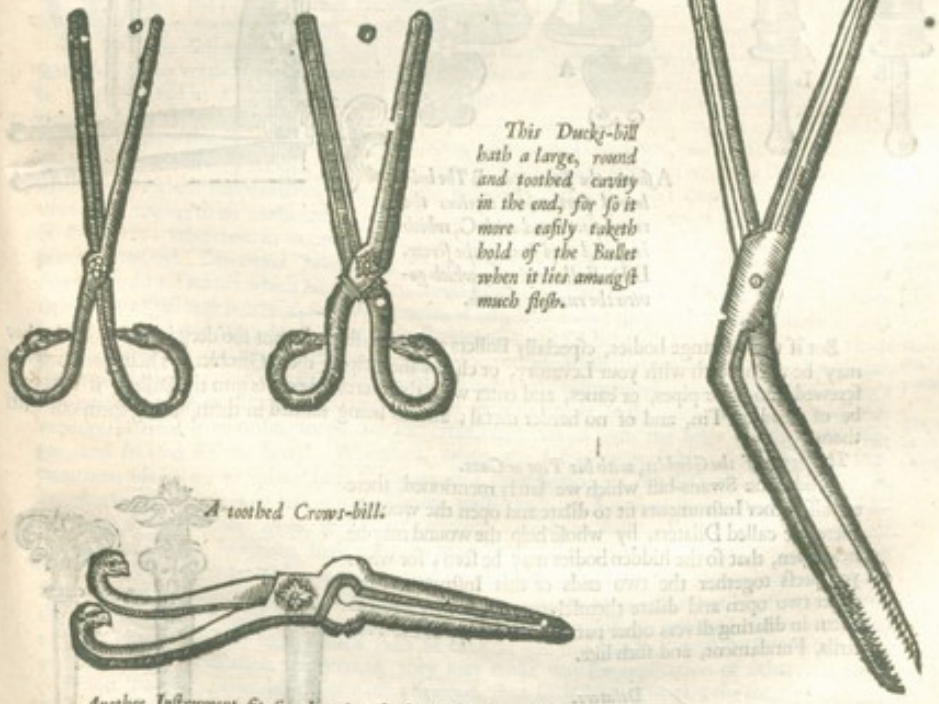
BOth the magnitude and figure of Instruments fit for drawing forth of bullets and other strange bodies, are various according to the diversity of the incident occasions. For some are toothed, others smooth, others of another figure and bigness; of all which sorts the Chirurgeon must have divers in a readiness, that he may fit them to the bodies and wounds, and not the wounds and bodies to his Instruments.

The Delineation of such like Instruments.

The strait Cranes bill being also toothed, fit for drawing forth hail-stones, pieces of armour, splinter of bones and such things as lye deep within.

The Ducks-bill.

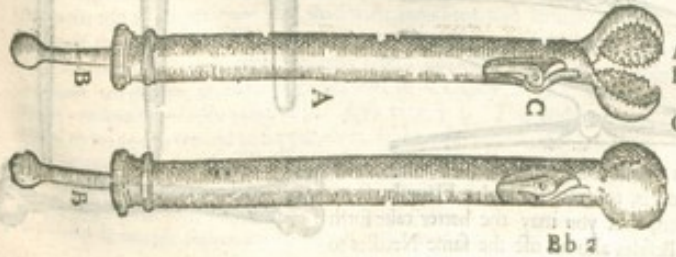
The crooked Cranes-bill, with teeth like a Saw.



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 Crows-bill.

Another Instrument fit for drawing forth of Bullets, which may be termed a Catch-bullet.

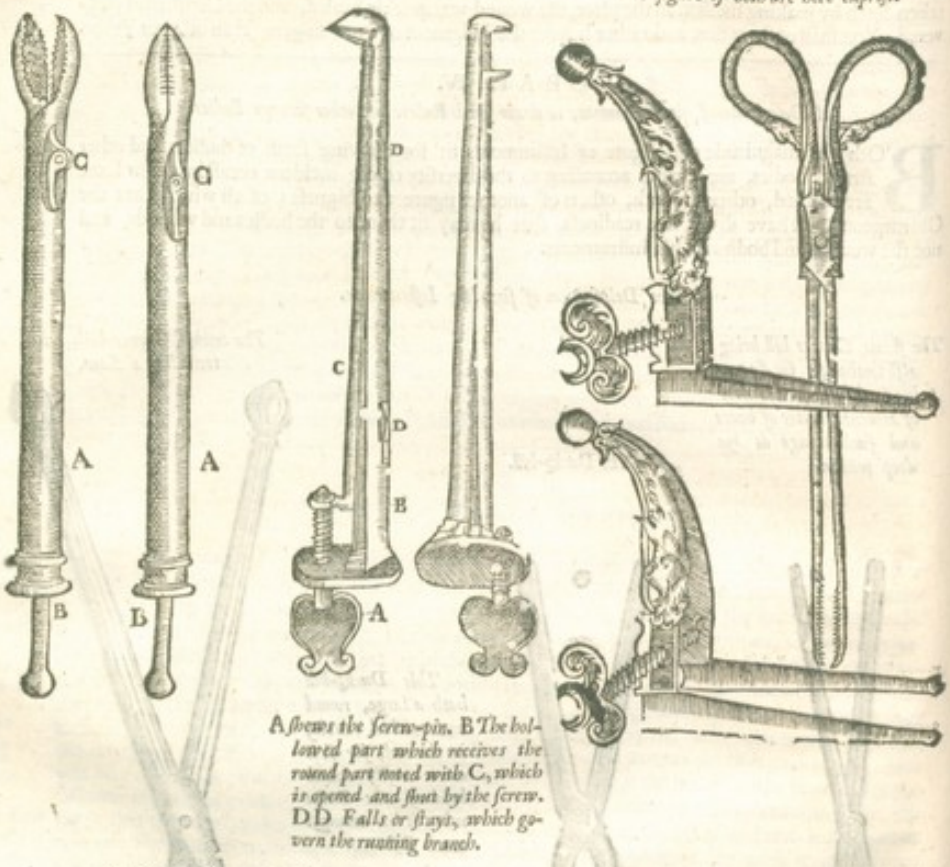


A *Shews the Trunk.*
B *Shews the rod, or string, which opens and shuts the joynt.*
C *The joynt.*

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.

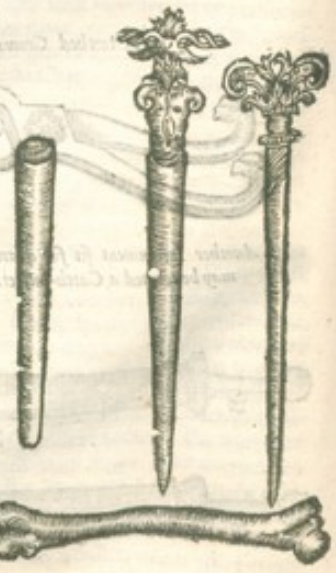
The Swans-bill opens with a screw; you may with this dilate the wounds, and so put in a strait Cranes-bil, as pincers to pluck forth strange bodies. The figure of both are here expresst.



A shews the screw-pin. B The hollowed part which receives the round part noted with C, which is opened and shut by the screw. D D Falls or stays, which govern the running branch.

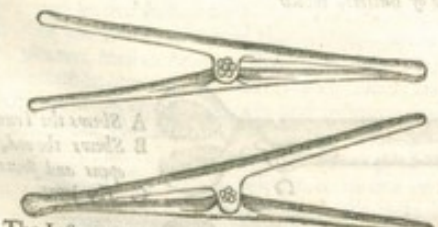
But if these strange bodies, especially Bullets and Hail-shot, be not too deep in the wound, they may be taken forth with your Levatory, or else by the help of these Gimblets. These Gimblets are screwed into their pipes, or canes, and enter with their screwed points into the Bullets, if that they be of Lead or Tin, and of no harder metal; and so being fastned 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.



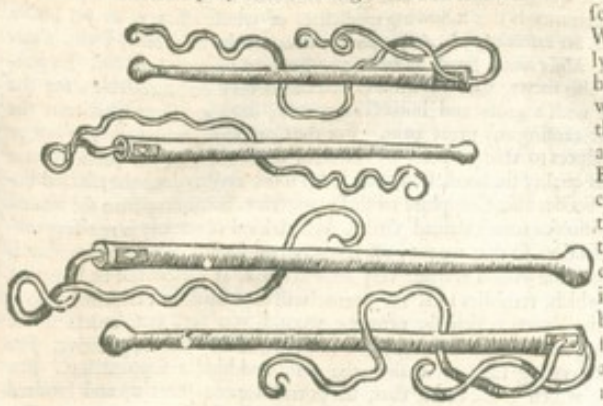
The Instruments which follow are called Seton-needles, or Probes; whose use is, to draw through a Flamula, so to keep the wound open, that you may the better take forth any strange body. Besides also we use the same Needles to search, or as it were to sound the deepness of the wounds,

and

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 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 small or slender, they will stick in the inequality of the flesh, neither will they be able to come to the Bullet. But if they be sharp and pointed, they will cause and renew the pain by pricking the flesh they meet withal, and 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 a good length.

What Probes fit to search these wounds.

Probes for to put flamula's through a Wound withal.



CHAP. IX.

What dressing must first be used, after the strange bodies are pluck'd or drawn out of the Wound.

WHen the strange bodies are drawn or pluck'd out of the wound, by those 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 medicines 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 Physicians; for the particular and topick medicines, (unless from the present constitution of the air, the condition of the wounded part, or from some other cause, there being a danger of a Gangrene) you must use suppuratives as you usually do in contusions; such as are oyls of Whelps, 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 drier medicines then fleshy, as we have formerly delivered speaking of wounds of the joynts; wherefore in wounds of the joynts and nervous parts you shall use more Venice Turpentine than oyl. *Laurentius Jolertus* the Kings Physician and Chancellor of the University of *Mompelier*, in a Treatise which he writ of wounds made with Gunshot, forbids the use of Escharoticks both actual and potential, in these wounds, if simple; for that they induce pain, inflammation, a feaver, gangrene, and other deadly symptoms. 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 increased, and carried 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 and 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 Vinegar or *Aqua 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* shall 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 oyl of Turpentine and Saint Johns-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 Civil Wars. After the use of *Ægyptiacum* you shall with emollient and lenitive medicines procure the falling away of the Eschar, and such a medicine is this following Oyl, being somewhat more than warm. ℞ *Olei violati lib.* iij. *in quibus coquantur catelli duo nuper nati, usque ad dissolutionem ossium, addendo vermium terrestrium, ut dicet præparatorum,* ℔ i. *Coquantur simul lento igne, deinde fiat expresso ad usum, addendo terebinth. venet.* ℥ iij. *Aqua vitæ* ℥ i. This Oyl hath a wonderful force to asswage pain, to bring the wound to suppuration, and cause the falling away of the Eschar. This ensuing Oyl is made more easily. ℞ *Olei seminis lini, & lilior. an.* ℥ iij. *Unguent. basilic.* ℥ i. *Liquefiant simul & fiat medicamentum*: Put of this a sufficient quantity into the wound; for this being applied 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 kinds of wounds, according

A caution in the use of suppuratives.

Why Escharoticks must be eschewed in these kinds, if they be simple.

How an Eschar may cause putrefaction.

The description of an *Ægyptiacum.*

How and when to temper this *Ægyptiacum.*

The oil of Whelps a digestive. Anodyne, and fit medicine to procure the falling away of an Eschar.

ding

ding to the rule of *Hippocrates*, which wishes every contused wound to be presently brought to suppuration, for so it will be less subject to a Phlegmon; and besides, all the rent and bruised flesh must putrefie, dissolve and turn to quitture, that new and good flesh may be generated instead thereof. *Laurentius Laubertus* much commends this following medicine, of whose efficacy, as yet I have made no trial. ℞ *Pulver. mercur. bis calcinati,* ʒ i. *Adipis porci recentis, vel butyri recentis,* ʒ viij. *Camphoræ in aquæ vitæ dissolutæ,* ʒ ij. *Misce omnia simul, addendo tantillum olei liliorum, aut lini.* Experience taught him, and Reason also shews, that this kind of remedy is very commendable; for the powder of Mercury, if mixed with a gross 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 foggy. But when the wound is made very near at hand, it cannot but be burnt by the flame of the powder; in which, remedies used for burns, will be useful, not omitting such as are fit for contusions. But for those 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 shuts 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 concrete blood, and therefore subject to putrefaction, may be evacuated. But for those parts, which somewhat farther distant from the wound, encompass the contused flesh, they require refrigerating and strengthening medicines, so to hinder the falling down and settling of the humor in that part, which is this ensuing medicine. ℞ *pul. boli armen. sanguin. Draconis. Myrrhæ, an.* ʒ i. *succi solan. sempervivi, portulac. an.* ʒ i ß. *albumin* iiij. *ovorum. oxyrhodin. quantum sufficit; fiat linimentum, ut decet.* You may use this and the like until the suspected symptom be past fear. Neither must you have less care, of binding up and rolling the part, than of your medicines; 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 four and twenty hours, that is, until the wound be come to suppuration; but when the quitture begins to flow from it, and consequently the pain and Feaver are increased, it shall be dreſt twice a day, that is, every twelve hours. And when the quitture flows more abundantly than usual, so that the collection thereof is very troublesome to the Patient, it will be requisite to dress it every eight hours; that is, thrice a day. Now when as this abundant efflux is somewhat slaked, and begins to decrease, it will suffice to dress it twice a day. But when the Ulcer is filled with flesh, and consequently casts forth but little matter, it will serve to dress it once a day, as you did at the first.

Lib. de ulcer.

The faculties of the powder of Mercury.

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 Oyls formerly described, adding to them the yolks of some eggs and a little Saffron; and use this medicine, until 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 symptoms. Yet most usually *Pus* or quitture appears within three or four days, 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 medicine some Turpentine washed in Rose, Barley, 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 *Galen*'s prescript, we must not use hot medicines in Winter, and less hot in Summer. Then in the next place use detersives; as, ℞ *Aquæ decoctionis hordei quantum sufficit, succi plantaginis, apii, agrimon. centaurei minoris, an.* ʒ i. *Bulliant omnia simul; in fine decoctionis adde terebinthinæ venetæ* ʒ iij. *Mellis rosat.* ʒ ij. *farin. hordei* ʒ iij. *Croci* ∋ i. Let them all be well mixed together and make a Mundificative of an indifferent consistence. Or, ℞ *Succi clymeni, plantag. absinth. apii, an.* ʒ ij. *Tereb. venet.* ʒ iiij. *Syrup. absinth. & mellis ros. an.* ʒ iij. *Bulliant omnia secundum artem postea colentur in colatura, adde pulver. aloes, masticbes, Ireos Florent. far. hord. an* ʒ i. *Fiat Mundificativum ad usum dictum.* Or, ℞ *Terebinth. venet. lotæ in aq. ros.* ʒ v. *Olei ros.* ʒ i. *Mellis ros.* ʒ iij *myrrhæ, aloes, mastich, aristoloch. rotundæ. an.* ʒ i ß. *Far. 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 symptoms. But seeing Tents are used both to keep

Why wounds made by Gunshot are so long before they come to suppuration.

Why Turpentine must be washed. *Gal. l.* 3. *Meth.*

A detergent medicine.

Why Tents must be neither too long nor thick.

keep open a wound so long, until all the strange bodies be taken forth, as also to carry the medicines, wherewithal they are anointed, even to the bottom of the wound: Now if the wound be sinuous and deep, that so the medicine 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.* iiij. *agrimon. centaur. minor. pimpinellæ, absinth. plantag. M.* ℈. *Rad. aristoloch. rotund.* ʒ ℈. *Fiat decoctio ad lib.* ʃ. *in colatura expressa dissolve aloes hepatica* ʒ iiij. *Mellis ros.* ʒ 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 cleanse the filth, and waste 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 of the wound; besides also, it only works upon such kind of flesh. For this purpose, I have also made trial of the powder of Mercury and burnt Alum equally mixed together, and found them very powerful, even 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 hour, they touch the sides of the wound, cause pain, and renew other malign symptoms; 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 wrapping it up to the top. All the the boulsters and rowlers, which shall be applied 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 special care, that you do not bind the wound too hard, from 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 hindred from coming to the part.

When you must use injections.

An injection.

The quantity of *Ægyptiacum* to be used in an injection.

Why 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 stroke, cannot be pulled forth at the first dressing, for that they either do not yield or fall away, or else cannot be found by the formerly described Instruments. For which purpose this is an approved medicine to draw forth that which is left behind. ℞ *Radic. Ireos Floren. panac. & capper. an.* ʒ iij. *Aristoloch. rotund. mannæ, thuris, an.* ʒ i. *In pollinem redacta, incorporentur cum melle rosar. & terebinth. venet. an.* ʒ ij. Or ℞ *Resin. pini ficæ* ʒ iij. *Pumicis combusti & extincti in vino albo, radic. Ireos, aristolochiæ, an.* ʒ ℈. *Thuris* ʒ i. *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 cleansed and purged, and all strange bodies taken forth; Natures endeavours to regenerate flesh, and cicatrize it, must be helped forwards with convenient remedies, both taken inwardly, and applied outwardly. To which things we may be easily and safely carried 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* says, *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 medicines are fit for cholerick, others some 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 always feeding, as to him who is accustomed to eat but once or twice a day. Hence it is that a diet consisting only of Panada's is more fitter for Italians than for French men; for we must give somewhat to custom, which is as it were another nature. Vocations and daily exercises, are referred to diet: For other things beit Husbandmen and Labourers, whose flesh is dense, and skin hardned 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) succour the fainting, or decaying strength; wherefore if it be needful 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

The Indication which is drawn from the strength of the Patient is the chiefest of all other.

may be drawn from the incompassing air, under which also is comprehended that, which is taken from the season of the year, 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 *Avignon*; 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 hurtful 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 *Avignon*, 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 Countreys; let him understand that this must not be attributed to the manifest and natural heat of the air, but to a certain malign and venenate humor, or vapour 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 manner. The different sense of the parts, indicates and requires the like variety of remedies; for you shall not apply so acrid medicines 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 needful for the preservation of life; for oft-times wounds of the brain, or some other of the natural and vital 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 midriff, the liver, ventricles, small guts, bladder, if somewhat large are deadly; as also those which light upon a joynt in a body repleat with ill 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 symptom, as 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 *Galen*'s counsel, 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 cannot be cured. Which counsel must well be observed; for in this composure of affects, which distracts the Emperick; on the contrary, the rational Physician hath a way prescribed in a few and these excellent words, which if he follow in his order of cure, he can scarce miss to heal the Patient. Symptoms truly as they are symptoms, yield no indication of curing, neither change the order of the cure; for when the disease is healed, the symptom vanishes as that which follows the disease, as a shadow follows the body. But symptoms 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 all the formerly mentioned indications may be drawn to two heads; the first is, to restore the parts 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.

Why wounds of the head at *Paris*, and of the legs at *Avignon* are hard to be cured.

An indication to be drawn from the quick and dull sense of the wounded part.

Gal. lib. 7. Meth. & 2. ad Glauc.

Gal. l. 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 skilful, and labour to assuage pain, hinder defluxions, prescribe a diet in those six things we call not-natural, forbidding the use of hot and acrid things as also of Wine; for such attenuate humors, and make them more aptfor 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 days 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 plentiful efflux thereof, the part is freed from danger of inflammation and fulness. 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 greatness 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 fourth, fifth, sixth, or some more days 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

Why such as are wounded must keep a slender diet.

Why we must open a vein in such as are wounded by Gunshot.

ture, or Art; and if by Art, then rather with a Clyster than purging medicines taken by the mouth, for that the agitation of humors, chiefly in the first days 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 needful, that is, blood-letting and purging; though the Patient be neither plethorick, nor repleat with ill humors. But the care hereof must be committed to the judgment of the learned Physician; pain, if joyned with inflammation shall be mitigated, by anointing the parts near unto the wound with *unguent. nutritum*, composed with the juice of Plantain, Housleek, Nightshade, and the like. *Unguentum Diacalcitheos* described by *Galen* dissolved with vinegar, oyl of Poppies 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 assuage 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* ℔ i ʒ ß. *Bulliant parum, addendo olei violacei, & rosar. an.* ʒ iij. *Vitell. ovorum ext.* iiij. *pulver. rosar. rub. flor. chamæm. & meliloti, an.* ʒ ii. *Farin. fabar. & hordei, an.* ʒ i. *misce, fiat cataplasma secundum artem.* Also in this case you may easily make a medicine, of bread-crums boiled in Oxycrate and oyl of Roses. The cure of Tumors, if any associate the wound, may be found in their proper place. Natures motion, whether to suppuration, or any such thing, must still be observed, and helped by the Physician and Chirurgeon, as the ministers and servants thereof.

Gal. lib. 4. Meth. cap. 6.

Gal. lib. 1. de comp. Med. secund. Gen. c. 6.

An Anodyne and ripening Cataplasm.

CHAP. X.

Of Bullets which remain in the body, for a long time after the Wound is healed up.

LEaden Bullets lye in some parts of the body some whiles seven, eight, or more years, so that they neither hinder the agglutination of the wound, neither doth any other symptom happen thereupon, as I have divers times observed; until 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 metal, 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 symptoms. Yet a Leaden bullet cannot remain any long time in nervous or noble parts without danger.

Why Leaden Bullets lye in the body so many years without doing any harm.

CHAP. XI.

How to correct the constitution of the Air, so that the noble parts may be strengthened, and the whole body besides.

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 air with all diligence, and 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 medicines, which are to be taken inwardly and applied outwardly. In the morning, three hours before meat, let the Patient take some certain quantity, as the Physician shall think fit, of the Electuary *Diarrhodon Abbatis*, or *Aromaticum rosatum, triasantalon, bimoschum, lætificans Galeni*, or some such other like. And you shall apply some such Epitheme as is here described to the Heart and Liver. ℞ *Aquæ rosar.* ʒ iiij. *aquæ bugloss. aceti boni, an.* ʒ ij. *coriandri præparati* ʒ ß. *caryophyll. cortic. citri an.* ʒ i. *Sant. rub.* ʒ ß. *corall. utriusque* ʒ ß. *Camphoræ* ℈ i. *Croci* ℈ ß. *Pulver. diarrhod. abbat.* ʒ ii. *Theriacæ & Mithridat. an.* ʒ ß. *Pul. flo. chamæm. & melil. an.* ʒ iij. *misce, fiat epithema.* Let it be applied warm by dipping a Scarlet cloth therein. You shall frequently put odoriferous and refrigerating things to the Patients nose, to strengthen the animal faculty; as, ℞ *Aquæ rosar. & aceti boni an.* ʒ iij. *caryophyllorum, nucis moschat. cinnamomi conquassatorum, & Theriacæ Galeni, an.* ʒ i. 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 thereto. As, ℞ *Ros. rub. violar. an.* ʒ iij. *baccarum myrti, juniperi, santal. rub. an.* ʒ ij ß. *styracis calamit.* ʒ ij. *aq. rosarum. quantum satis est: liquefiat simul cum cerâ albâ quod sufficit, fiat ceratum ad comprehendendos supra-dictos pulveres cum pistillo calido, & ducatur in pomum.* Or, ℞ *Rad. Ireos Florent. majoran. calam. aromat. ladani, benzoini, rad. cyperi caryophyl. an.* ʒ ij. *Moschi. gra. 4. fiat pulvis cum gummi tragacanth. quod sufficit.* Or else, ℞ *Ladani puri* ʒ i. *Benzoini* ʒ ß. *styracis calamit.* ʒ vj. *Ireos flor.* ʒ ß. *Caryophyl.* ʒ iij. *majoran. ros. rub. calami aromat. an.* ʒ ß. *in pollinem redigantur omnia, & bulliant cum aqua ros. quantum sufficit; colentur, colata, liquefiant cum justa cerâ albâ quantitate, styracis liquidæ* ʒ i. *Fiat ad modum cerati, & cum pistillo fiat pomum, addita moschi* ʒ i. Also you may corroborate the animal faculty by application of frontals, as also procure sleep, and ease the pain of the head; as, ℞ *Aq. ros.* ʒ ii. *olei ros. & papav. an.* ʒ i ß. *aceti boni,* ʒ i. *trochisc. de camphora.* ʒ ß *fiat frontale.* Linnen rags dipped herein may be applied to the temples of the forehead, and often renewed, otherwise by their heat, driness, and hardness, they will cause watching instead of sleep. Neither must you in the mean time bind the head too hard, lest by intercepting and hindring the pulsation of the temporal Artery, you increase the pain of the head. You shall make a fire in the Patients Chamber of odoriferous woods, as Juniper, Bay-tree, the pruning or cuttings of Vines, Rosemary, and Orris roots. For the

Cordials to strengthen the noble parts.

A cordial Epithem.

Pomanders.

Frontals to cause rest, and strengthen the animal faculty.

A ſweet water.

the ſame purpoſe, you may ſprinkle the floor with ſweet water; if the Patient be able to undergo ſuch coſt. As, R *majoranæ, menthæ, radic. cyperi, calami aromat. ſalviæ, lavendulæ, fœnicul. thymi, ſtœchad. flor. chamæm. melilot. ſatureiæ, baccarum lauri, & juniperi. an. M.* iij. *pulv. caryophyl. nucis Moſcat. an* ℥ i. *aquæ roſar. & vitæ, an. lib.* ij. *vini albi boni & odoriferi. lib.* x. *bulliant omnia in balneo Mariæ ad conſumptionem.* You may alſo make perfumes to burn in his chamber: as thus, R *carbonis ſalicis* ℥ viij. *ladani puri* ℥ ij. *thuris maſculi, ligni & baccarum Juniperi, an.* ℥ i. *xyloaloes, benjoini, ſtyracis calamit. an.* ℥ ſ. *Nucis moſchatæ, ſantal. citrin. an.* ℥ iij. *caryophyll. ſtyracis liquidæ, an.* ℥ ij. *zedoariæ, calami aromat. an.* ℥ i. *gummi tragacanth. aqua roſar. ſoluti, quod ſit ſatis.* Make hereof perfumes in what faſhion you pleaſe. For the rottenneſs and corruption of bones, we will treat thereof hereafter in due place.

Perfumes to burn.

CHAP. XII.

Certain memorable Hiſtories.

HEre I think 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*, Governor of the Dutchy of *Luxenbourg*, Knight of the Order of *Burgundy*, coming to the aid of the French King, was at the Battel of *Monconſour*; where in the conflict he received ſo great a wound at the joynt of the left arm with a Piſtol-bullet, that the bones were ſhivered and broken in ſo many pieces, as if they had been laid upon an Anvil and ſtruck with an hammer: Hence proceeded many malign ſymptoms, as cruel and tormenting pain, inflammation, a feaver, an œdematous and flatulent tumor of the whole arm even to the fingers ends, and a certain inclination to a Gangrene: Which to reſiſt, *Nicolas Lambert*, and *Richard Hubert*, the Kings Chirurgeons, 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 Gangrene. 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 ſhew 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 ſymptoms, 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 ſpoonful of *Aqua vitæ* with ſome Treacle diſſolved therein. I endeavoured to repreſs the œdematous and flatulent Tumor poſſeſſing all the arm 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 increaſed, that I was in a great deal of fear, leſt 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 Abſceſſes 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 and 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.

The malign ſymptoms which uſually happen upon wounds made by Gunſhot.

Matter may flow from the wounded limbs into the belly.

A brief recital 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 *Arſchots* Brother, not far from *Mounts* a City of *Henalt*. He kept his bed ſeven 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 ſymptoms, intolerable pain, a continual feaver, cold ſweats, watchings, excoriation of the hips 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 continual 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 thigh-bone was broken long-ways, and ſide-ways 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, and 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 ſcarce 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 made 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 Incaſions, ſo to reſtrain and amend the putrefaction, repreſs the ſpongy, looſe, and ſoft fleſh, reſolve the œdematous and flatulent Tumor, aſſwage the pain, and ſtir up and ſtrengthen the native heat almoſt oppreſt by the abundance of excrementitious humors,

Horrid ſymptom occaſioned by a wound made by Gunſhot.

Inciſions wherefore made.

mors, so that it could scarcely assimilate any nourishment and adjoyn it to the parts. Then I fomented the affected part with Sage, Rosemary, Thyme, Lavender, Chamomile and Melilot-flowers, and Red-rose leaves boiled in White-white, and Lye made of Oak-ashes, adding thereto as much Salt and Vinegar as I judged requisite. This Fomentation did attenuate and draw forth the morbifick humor. Now we used them long and often, so to waste the humor more by drying up and breathing through 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 upward, and so on every side, and somewhat long withal: For a short friction draws 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, and foal of his foot; but they were to be somewhat quenched, and sprinkled with Wine and Vinegar, with a small quantity of *Aqua vitæ*. Much wateriſh 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 Oak ashes, wherein Sage, Rosemary, Lavender, Salt and Cloves, were boiled, some *Aqua vitæ* added, were applied 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 one day, the tumor became very great. But thick linnen boulsters were laid upon the lower cavities of the Ulcer; that so the *Sanies*, or filth, might be more easily pressed forth. But I had always a special care that the orifices of the Ulcers should be kept open with hollow tents or pipes put therein: And sometimes this following Cataplasm was applied to resolve the tumor. ℞ *Far. hord. fabar. & orobi, an.* ℥ vſ. *Mellis com. & terch. an.* ℥ ij. *flo. chamæm. melil. & roſ. rub. an.* ℥ i. *Pulv. rad. Iridis, Flor. cyper. Maſt. an.* ℥ iii. *Oxymel. ſimp. quantum ſufficit*; *fiat cataplaſma ad formam pultis ſatis liquidæ.* An *emplaſtrum de Vigo* without Mercury was applied thereto, whereby the pain was much asswaged, and the tumor lessened: Yet were they not applied before the parts were throughly heated by the Fomentation, Frictions and Evaporations; for otherways this Emplaister 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 fifteen days. Also besides the particular frictions of the affected parts, I appointed other general 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 success of those Patients, which have recovered by means, and the favour of God; but that thus I may more fully and perfectly, by familiar examples, instruct young practicioners, in the operations of Chirurgery.

Wherefore I used Fomentations.

Mixed or round frictions, as they term them.

A medicated Lye.

A discussing Cataplasm.

CHAP. XIII.

An Apology concerning Wounds made by Gunshot.

THere lately came to my hands a Book written by a certain Physician, 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 judgment 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 use (saith he) of suppurative medicines, have killed many who have been but lightly wounded with Gunshot; but acrid medicines, as *Ægyptiacum*, have killed more. Neither is the counsel 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 natural constitution, ought not to indicate change of medicines; but much less must Thunder and Lightning be compared to the shooting of great Ordnance. These are the chief heads of this his Book; which, because they dissent from the truth, and those things I have formerly delivered, I have thought good here to confute. First, seeing leaden Bullets which 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 Laws 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 those who with great praise are Physicians to Kings and Princes, I mean *Joubert* and *Potallus*, think it lawful 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 Physicians are such, as, daily conversant in Armies and Kings-houses, have healed and daily cure as many wounded by Gunshot as this Physician our Antagonist hath seen in all his life. Neither only do these whom I have named thus cure these wounds, but almost all that dress such kind of wounds do the like; so that, if there be nothing which may hinder, or indicate to the contray, they prudently apply suppuratives. And I wonder that he hath not observed how his neighbour *Doublet* the

The occasion of writing this Apology.

The chief heads of our adversaries Treatise.

All wounds made by Gunshot are contused.

A ſuppurative medicine of tried efficacy.

the Emperick, cures deſperate wounds of this nature, with no other than a ſuppurative medicine, compoſed of Lard, the yolk of an Egg, Turpentine, and a little Saffron. In the year, 1538. there was at *Turin* whilſt I was Chirurgeon there to the Marſhal of *Montejan* the Kings Lieutenant General in *Piedmont*, a certain Chirurgeon wondrous famous for curing theſe wounds, and yet he uſed nothing elſe but the Oyl of Whelps, (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 poured it ſcarce 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 do uſe with happy ſucceſs.

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 powerful to hinder putrefaction, if beginning; or correct it, if preſent. Now theſe wounds often degenerate into virulent, eating, ſpreading and malign Ulcers, which caſt forth a ſtinking and Carion-like filth, whence the part gangrenates, unleſs you withſtand them with *Ægyptiacum*, and other acrid medicines, being greatly approved by the formerly named Phyſicians, 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 Oyntment, and conſider the nature of all and every the ingredients thereof, he ſhall underſtand that this kind of Unguent is 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 other ſome. 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 the putredinous vapours of bodies lying unburied after great Battels, and Shipwracks of great Armadoes, infect with the like quality our bodies and wounds?

A Hiſtory.

In the year, 1562. when the Civil Wars concerning Religion firſt begun in *France*, at *Peze*, 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 thouſands of people died 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 thoſe 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 Peſtilence. For he had learn'd 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 *Rouen*, 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 skilful by experience, to uſe *Unguentum Ægyptiacum*, and medicines of the like faculty, inſtead 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 reflux 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 learn'd 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 Battel at *Dreux*, and at St *Denis* which were fought in Winter, there died 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 the vehemency and largeneſs of their wounds, and the ſpoil the bullet made in their members; but above all, by reaſon of the cold. For cold is moſt hurtful 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 believe me, let him make trial himſelf, and go Winter to the Chappel at Mount *Senis*, oneof 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.

Hip. Aph. 1. *ſect.* 3.

In our ſecond Diſcourſe.

The power of the Stars upon the air and our bodies.

Aphor. 40. *ſect.* 6.

The ſimilitude between Thunder and great Ordnance, maintained.

He cavils for that I compared Thunder and Lightning with diſcharging of Pieces 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 judge, 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

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in both, and certainly the Report of great Ordnance may be heard sometimes at forty miles distance, whilest they make any great battery in the besieging of Cities. Besides also, Iron Bullets cast forth with incredible celerity by the fired Gun-powder, 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 Money not hurting the Purse; Now many by the onely violence of the air agitated and vehemently moved by shooting a piece of Ordnance, as touched with Lightning, have died in a moment; their bones being shivered and broken, no sign of hurt appearing in the skin. The smell of Gun-powder when it is fired, is hurtful, fiery and sulphurous, just like that which exhales or comes from bodies killed with Lightning. For men do not onely shun the 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 shewn by examples, not onely horrid to see, but even to hear reported, as of Mines, the Arcenal of *Paris*, the City of *Malines*. 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 alike in all things. For they neither agree in substance nor matter, but onely in the manner of violent breaking asunder the objects.

Now let us see and examine what manner of cure of Wounds made by Gun-shot our Adversary substitutes for ours. For he would have suppuratives used and applied, yet such as should not be hot and 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 Physician 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 dried. 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 Gun-shot, not first bringing that which is contused to perfect maturity. If he affirm he can, I will be judged by whatsoever Practitioners he will, to judge 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 Gun-shot, 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 staid, he would have a Medicin applied consisting of the white of an Egg, 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 remedy, a Medicin wherein was some Vinegar, into a Wound received by a Moor, an attendant of the Earl of *Reissy*, 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 Egg, which he saith is equal in operation to the natural 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 onely require the uniting of the loosed continuity.

Galen. lib. 9. simpl. 10. Method.

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 Gun-shot, seeing by reason of their driness they hinder suppuration, which unless it be procured, the Patient cannot be healed. Wherefore such things ought not to be put into Wounds of this nature, before they be ripened, washed and cleansed from their filth. Yet can I scarce 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 the 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 onely serve to hinder the agglutination thereof. But how can these Balsams come to the bottoms of Wounds without Tents, when as it is their chief property to carry Medicins even to the innermost parts of the Wounds, and always 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 until the contusion come to perfect maturation, dissolving it it in a decoction of the tops of Wormwood, S. *Johns* Wort, 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 Honey of Roses in Plantain Water, carefully skimming it, until it be boiled to the consistence of Honey, 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 judge, 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 joined with the Wound, then to move nothing after the first dressing until 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 it self, nor the truth, cannot but much pusle a Novice and young practitioner in Chirurgery, who is not yet versed in the Art, or the operations thereof.

Ægyptiacum howsoever made, is a cleanser, not a suppurative.

CHAP. XIV.

Another Apology against those who have laboured with new Reasons to prove that Wounds made by Gun-shot are poisoned.

The occasion of this Apology.

SOme few Moneths ago, I visited a Patient together with some learned Physicians and skilful Chirurgeons. Now they, as it oft-times happens, in way of discourse, begun to argue of the condition and quality of Wounds made by Gun-shot, and endeavoured to prove that they might be poisoned, by five reasons. Not truly through the occasion of the Gun-powder, for they all confessed that it was free from poison, whether you have regard to its essence, or to its composition; but by the Bullet into which the poison 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 soever you please. But methinks 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 conjoined 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 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 Metals; how then can it be commixt with another thing distinct in the whole kind, much more in *Species* and Form, to wit, poison? Their second reason is this; Iron (say they) which is more dense, solid, and less porous, may receive some venenate substance and quality, as the Arrows of the Ancients which were dipped in poison, testifie; therefore must Lead much more be capable thereof. I answer, that the surface of Iron may be poisoned, 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 casts off and purges it self from the dross and impure 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 juices or liquors wherewith it is watered or quenched. For if that were necessary, it might be better and more easily performed, when the Metal is first cast, than when it is beaten into Plates or Bars; which answer shall serve to confute their fourth reason; wherein they say, that Bullets may be made so poisonous by the commixture of the juices of Monks-hood, Oleander, Crow-foot, and other such like things which in their whole substance are contrary to ours, that the Wound which is made with them cannot but be poisoned. But I on the contrary affirm, that mixture is onely of those things, which may not onely be put, but also stick thereto, and be mutually united; but how can Water, or any other liquid juice so much as onely stick to Lead, as that which is a solid and 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 forefaid juices, or the like, then when the Lead is cold, weigh each of them severally and you shall 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 poison commixt and united with the Bullet can be dissipated by the fire and flash of Gun-powder. The answer to this objection is easie. For when we say, that although the Bullet may be infected by poison perfectly commixt with the Lead, yet all the force of the poison 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 powder at the discharging of the Piece, 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 will not be satisfied by these reasons, let him consult, and read *Matthiolus*. There are (saith he) some in these later times wholly ignorant of things, who (if we may say 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 poison. But how absurd and ridiculous their opinion is, let them judge, (for it needs no clearer reproof) who have but a little knowledge in natural things, but chiefly in Metals. These are my Reasons, these the Authorities of men excelling in Learning and Judgment, that confirm me in my ancient and former opinion, that Wounds made by Gun-shot do not partake of any venenate quality.

The reason of our Adversary that the Bullets may be poisoned, set down and confuted.

In Praefat. l. 6. Dioscor.

CHAP.

CHAP. XV.

How Wounds made by Arrows differ from such as are made by Gun-shot.

WOunds made by Arrows and Bolts shot out of Cross-Bows, and such like things, differ chiefly in two things, from those which are made by Gun-shot. 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 poisoned. 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.

Wounds made with Arrows and such like things, are often without contusion. But are oft-times poisoned.

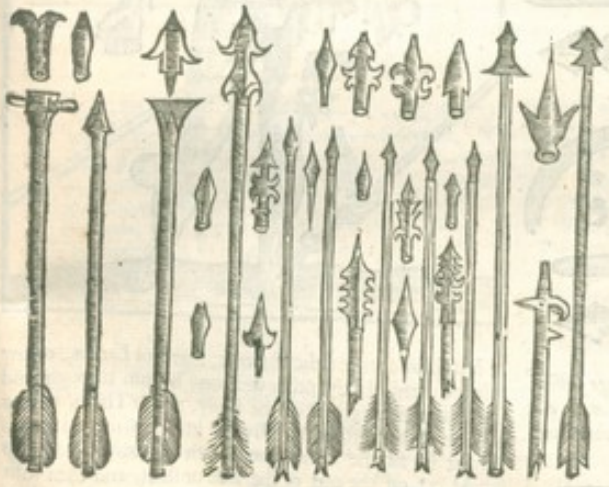
CHAP. XVI.

Of the diversity of Arrows and Darts.

ARrows and Darts are different amongst themselves both in manner, 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, Glass, Bone. In figure, for that some are round, others cornered, some are sharp-pointed, some barbed, with the barbs standing either to the point, or shafts, or else across, or both ways, but some are broad and cut like a Chissel. For their bigness, some are three foot long, some less. For their number, they differ in that, because some have one head, others more. But they vary in making, for that some of them 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 onely, others besides that, by poison, wherewith they are infected. You may see the other various shapes represented to you in this Figure.

The differences of Arrows. In matter. In figure. In bigness. In number. In making. In force.

The Figure of divers sorts of Arrows.



CHAP. XVII.

Of the difference of the wounded parts.

THe wounded parts are either fleshy or bony; some are near the joints, others seated upon the very joints; some are principal, others serve them; some are external, others internal. Now in wounds where deadly signs appear, it is fit you give an absolute judgment to that effect: lest you make the Art to be scandalized 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 artificial Work. For it is much better to try a doubtful remedy than none at all.

You must not leave the weapon in the Wound.

CHAP. XVIII.

Of drawing forth Arrows.

YOu must in drawing forth Arrows shun Incisions and Dilacerations of Veins and Arteries, Nerves and Tendons. For it is a shameful and bungling part to do more harm with your hand than the Iron hath done. Now Arrows are drawn forth two ways, 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 readiness, chiefly that which hath a slit pipe and toothed without, into which there is put a sharp iron stile, 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

The manner of drawing forth Arrows and such weapons.

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 out-ſide, by preſſing together of the handle. You ſhall find the Iron or head that lies hid by theſe ſigns: there will be a certain roughneſs and inequality 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 a heavineſs and pain felt by the Patient both there and in the Wound.

A delineation of Inſtruments fit to draw forth the heads of Arrows and Darts which are left in the Wounds without 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 Gun-ſhot.

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 ſtaff ſhivered in pieces, or broken off; then it is fit the Chirurgeon with his cutting Mullets ſhould cut off the end of the ſtaff or ſhaft, and then with his other Mullets pluck forth the head, as you may ſee by this Figure.

CHAP. XIX.

How Arrows broken in a Wound may be drawn forth.

When to draw forth the weapon on the contrary ſide.

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 near 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* Arrows 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 Veſſels and Nerves by theſe hooked barbs. 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 cleanſed and conſolidated.

A Delater hollowed on the inſide with a Cranes-bill to take hold on the barbed head.

When by the ſame way it went in.

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 Arms, 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 Anatomy ſhunning the larger Nerves and Veſſels. Therefore for this purpoſe

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.

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 entered in by; you must first gently move it up and down, if it stick very fast in; but have a special care that you do not break it, and so leave some fragment thereof in the bone; then take it forth with your Crows-bill, or some other fit Instrument formerly described. Then press forth the bloud, 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 fulness and illness of humours, and less molested with inflammation, putrefaction, and other symptoms 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 Whelps, formerly described is very good to assuage pain. To conclude, you shall cure the rest of the symptoms according to the Method prescribed in our Treatise of Wounds in general, and to that we have formerly delivered concerning Wounds made by Gunshot.

A Caution.

The benefit of bleeding in Wounds.

CHAP. XXI.

Of poisoned Wounds.

If these Wounds at any time prove poisoned, they have it from their primitive cause, to wit, the impoisoned Arrows 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 poisoned with hot poison, as Arrows 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 symptoms upon Wounds which are impoisoned, being such as happen not in the common nature of usual 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 poison may be more powerfully drawn forth; to which purpose the sucking of the Wound, performed by one whose mouth hath no soreness 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 Ointments, Cataplasms, Emplaisters, and all sorts of local Medicins.

The signs of poisoned Wounds.

Remedies in poisoned Wounds.

The End of the Eleventh Book.

BOOK XII.

Of CONTUSIONS and GANGRENES.

CHAP. I.

Of Contusions.

A Contusion, according to *Galen*, is a solution of continuity in the Flesh or Bone, caused by the stroke of some heavy and obtuse thing, or a fall from on high. The symptom of this Disease is by *Hippocrates* called *Peliosis*, and *Melasma*, that is to say, blackness and blueness; the *Latins* term it *Sugillatum*. There are divers sorts of these Sugillations or blacknesses, according as the bloud is poured forth into the more inward or outward part of the body. The bloud 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 extremely wracked or tortured; and sometimes by too loud and forcible exclamations. Besides also, by a Bullet shot through the body, bloud is poured forth into the belly, and so often evacuated by the passages of the Guts and Bladder. The same may happen by the more violent and obtuse blows of a hard Truncheon, Club, Stone, and all things which may bruise and press the bloud out of the Vessels 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 bloud pours it self forth into the empty spaces of the Muscles, and between the Skin and Muscles; which affect the Ancients have termed *Ecchymosis*; *Hippocrates* calls it by a peculiar name *Nausiosis*, for that in this affect the swollen Veins seem as it were to vomit, and verily do vomit or cast forth the superfluous bloud which is contained in them. From these differences of Contusions are drawn the Indications of curing, as shall appear by the ensuing discourse.

Gal. lib. de arte constitut. Scil. 2. lib. de fracturis.

Causes of Bruises and Sugillations.

Scil. 2. lib. de fract.

CHAP. II.

Of the general Cure of great and enormous Contusions.

THe bloud poured forth into the body, must be evacuated by visible and not visible evacuation. The visible evacuation may be performed by Bloud-letting, Cupping-glasses, Horns, Scarification, Horsleeches, and fit purgative Medicins; if so be the Patient have not a strong and continual Fever. The not visible evacuation is performed by resolving and sudorifick potions, baths, and a slender diet. Concerning Bloud-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 bloud by opening a Vein, there may inflammations arise from the concrete bloud, from whence without doubt evil accidents may ensue. After you have drawn bloud give him four ounces of Oxycrate to drink; for that by the tenuity of its substance hinders the coagulation of the bloud 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 bloud, 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, and 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 Unguent. ℞ *Unguent. de althæa* ℥ vj. *olei Lumbric. chamem. anethi, an.* ℥ ij. *terebinth. venetæ,* ℥ iv. *farinæ fænugræ. rosar. rub. pulverisat. pul. myrtillorum, an.* ℥ j. *fiat linus ut dictum est.* Then give this potion which is sudorifick, and dissolves the congealed bloud. ℞ *Ligni guajaci,* ℥ viij. *radicis enulæ camp. consolid. majoris, ireos Florent. polypod. querni, seminis coriandri, anisi, an.* ℥ ß. *glycyrrhiz.* ℥ ij. *nepetæ, centaureæ, caryophyl. cardui benedict. verbenæ, an. m. ſ. aquæ fontanæ lib.* xij. Let them be all beaten and infused for the space of twelve hours, then let them boil over a gentle fire until the one half be consumed; let the Patient drink some half a pint of this drink in the morning, and then sweat some hours upon it in his bed, and do this for seven or eight days. 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 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 bloud; such as syrup of Vinegar, or Lemmons, of the juice of Citrons and such others to the quantity of an ounce dissolved in Scabious, or *Cardnus* Water. You may also presently after the fall give this drink, which hath power to hinder the coagulation of the bloud, and strengthen the bowels. ℞ *Rhei electi in pul. redacti* ℈ j. *aquæ rubiæ majoris, & plantagin. an.* ℥ j. *theriacæ* ℥ ß. *syrupi de rosis siccis,* ℥ ß. *fiat potus.* Let him take it in the morning for four or days. 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 yield not at all to these formerly prescribed Medicins, it will be good to give the Patient for nine days, three or four hours 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 *Cardnus* Water. They say that the Water of Green Walnuts distilled by an Alembick, is good to dissolve congealed and knotted bloud. Also you may use baths made of the decoction of the roots of Orris, Elecampane, Sorrel, Fennel, Marsh-mallows, Water-fern, or *Osmund* the Water-man, the greater Comfrey, the seeds of Fœnugreek, the leaves of Sage, Marjerom; the flowers of Camomile, Melilote, and the like. For a Warm Bath hath power to rarifie the skin, to dissolve the clotted bloud, by cutting the tough, and mitigating the acrid humours, by calling them forth into the surface of the body, and relaxing the passages thereof; so that the rebellious qualities being overcome, there ensues 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 and Urin, if it lie in the lower parts; by sweats and transpiration, if it lie next under the Skin. Wherefore Baths are good for those who have a *Peripneumonia* or inflammation of their Lungs, or a Pleurisie, according to the mind of *Hippocrates*, if so be that they be used, when the Fever 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 general remedies, as Bloud-letting and Purging; for otherwise there will be no small danger, lest the humours 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 Physician.

Ad sentent. 62. sect. 3. lib. de Articulis.

A Potion to dissolve and evacuate clotted bloud.

A hot Sheeps skin.

A discussing Ointment.

A Sudorifick Potion to dissolve congealed bloud.

Syrups hindering putrefaction and congealing of bloud.

A drink for the same purpose.

A Powder for the same.

The distilled water of green Walnuts.

Baths, *Lib. 3. de Vict. acut. & lib. 3. de morb.*

CHAP. III.

How we must handle Contusions when they are joined with a Wound.

Sect. lib. 5 aph.

EVery great Contusion forthwith requires Bloud-letting, or purging, or both; and these either for Evacuation or Revulsion. For thus *Hippocrates* in a contusion of the heel, gives a Vomitory Potion, 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 staid at the beginning with an Ointment made of Bole-Armenick, the White of Eggs and Oil of Roses, and Myrtles, with the Powders of Red Roses, Alum, and Mastich. At the second dressing apply a digestive made of the Yolk of an Egg, Oil of Violets and Turpentine. This following Cataplasm shall be applied to the near parts to help for-

forwards suppuration. ℞ *Rad. althææ, & lilii, an.* ℥ iv. *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; unless 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 sewed, 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.

A suppurative Cataplasm.

A Caution to be observed.

How contused Wounds must be sewed.

CHAP. IV.

Of those 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, until the malign symptoms, 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 equal scarifications; then shall you apply Cupping-glasses, or Horns, both for evacuation of the bloud, which causes the tumour and tension in the part; as also to ventilate and refrigerate the heat of the part, lest it turn into an Abscess. Neither must we, in the mean while omit gentle purging of the Belly. The first Topick Medicins ought to be astrictives, which must lie 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 hindered, as also that the part it self may be strengthened. This may be the form of such a remedy, ℞ *Albumina ovorum nn.* iij. *olei myrtini & ros. an.* ℥ j. *boli armeni, & sang. drac. an.* ℥ ß. *nucum cupress. gallar. pul. alum. usti, an.* ʒ 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 follow 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 concrete bloud is almost extinct; chiefly to ease the part of that burden, Cupping-glasses and Horns shall be applied 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 Razor, which may be straitned 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.

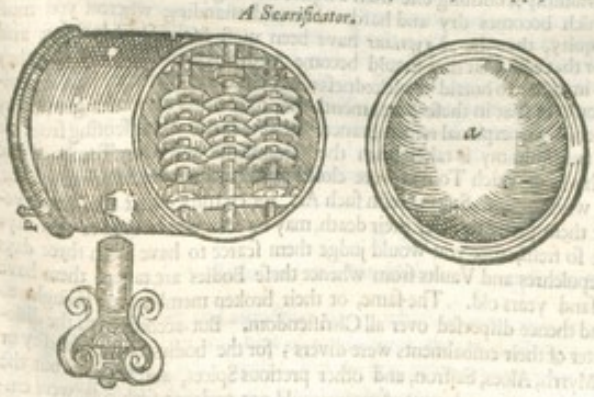
The use of a *Scarificator.*

Then shall you foment the part with strong Vinegar wherein the Roots of Radish, or of Dragons, Cuckow-pint, *Solomons* Seal, *Auripigmentum*, and the like, have been boiled; for such acrid things do powerfully heat, resolve, and draw the concrete bloud from the inner part of the body unto the Skin, which by its setling in the part affected, prohibits the entrance of the vital 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 onely that bloud which is poured forth of the Vessels, but also the other which is contained in the Vessels. Moreover also we must not use them, unless when the defluxion is staid. For small Contusions (which *Galen* judgeth by the softness of the contused part) it will be sufficient to apply to discuss them, Virgins-wax dissolved and mixed with Cummin-seeds, Cloves, the Root of the black Briony, (which hath a wonderful faculty to discuss all blackness and sugillation:) 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 Camomil, Bran, the Powder of Cloves and Nutmegs, adding thereto a little *Aquæ vitæ*; then put all in a linnen cloth, and apply it hot to the part. The following Emplaister doth powerfully discuss congealed bloud.

A fomentation to discuss and draw to the Skin.

Sect. 2. lib. de fract.

A Scarificator.



A *Shews the Cover.* B *The Box, or Case.*

℞ *Picis nigræ* ℥ ij. *Gum. Elemi* ℥ j. ß. *styracis liquidæ & terebinth. com. an.* ℥ ß. *sulphuris vivi* ℥ j. *Liquefiant simul, fiat Empl.* and let it be spread upon Leather, and so applied.

A discussing Plaister.

CHAP.

CHAP. VI.

Of that strange kind of Symptom 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 renitency, or any other such like cause; if you press it with your hand, a certain windiness goeth out thereof with a small whizzing, which may be heard, and the print of your fingers will remain, as in *œdemaes*. Unless you quickly make fit provision against this symptom, 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, and 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 meliloto*; also discussing fomentations shall be used. The cause of such a tumour 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 natural 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 tumours which are against Nature. For flatulencies are easily raised from a waterish and phlegmatick humour wrought upon by weak heat, which mixed with the rest of the humour, the tumour becomes higher.

Remedies for a mucous and flatulent humour of the Ribs.

The cause.

CHAP. VII.

A Discourse of Mumia, *or Mummy.*

Mummy a frequent and usual Medicin in Contusions.

The reason that the Author makes no mention there of amongst his Medicins.

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 fallen 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 Physicians, that in using remedies, the Indication must always be taken from that which is contrary to the Disease, How could I? or how can any other give Mummy in this kind of Disease, seeing we cannot as yet know what Mummy is, or what is the nature and effence 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 Physicians who prescribe Mummy, 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 Mummy to be nothing else but *Pissasphaltum*; now *Pissasphaltum* 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 concretes into somewhat a harder substance than dried Pitch, as *Dioscorides* saith. *Bellonius* saith, that Mummy is onely 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 Desarts of *Arabia*; in which Countrey they say the Sands are sometimes carried and raised up with such force and violence of the Winds, that they overthrow and suffocate such passengers as they meet withall; the flesh of these, dried by the Sand and Wind, they affirm to be Mummy. *Matthiolus* following the more usual and common opinion, writes that Mummy 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 antiquity, 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 suspect or imagine so horrid a wickedness; but either for that they held an opinion of the general Resurrection, or that in these Monuments they might have something whereby they might keep their dead friends in perpetual remembrance. *Thevet* not much dissenting from his own opinion, writes that the true Mummy is taken from the Monuments and stony Tombs of the anciently dead in *Egypt*, the chinks of which Tombs were closed and cemented with such diligence, the enclosed 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 judge them scarce to have been three days buried. And yet in those Sepulchres and Vaults from whence these Bodies are taken, there have been some Corps of two thousand years old. The same, or their broken members are brought to *Venice* from *Syria* and *Egypt*, and thence dispersed 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 were embalmed with Myrrh, Aloes, Saffron, and other pretious 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*.

The opinion of the *Arabians* concerning it.

Lib. 4. cap. 84.

Another opinion of Mummy.

Another.

Now

Now *Mathiolus* saith, that all the Mummy which is brought into these parts, is of this last kind and condition. For the Noble-men 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 dried them in an Oven, so to sell them thus adulterated in stead of true Mummy. Wherefore we are thus compelled both foolishly and cruelly to devour the mangled and putrid particles of the carkasses of the basest people of *Ægypt*, 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 powerful 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 tried a hundred times; and as *Theret* witnesses, he tried in himself, when as he took some thereof by the advice of a certain *Jewish* Physician in *Egypt*, from whence it is brought; but it also infers many troublesom symptoms, as the pain of the heart, or stomach, vomiting and stink of the mouth.

What our Mummy usually is.

Mummy is no way good for contusions.

I, perswaded by these reasons, do not onely my self not 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 *Galen*'s opinion, in *Method. med.* to drink some Oxycrate, which by its frigidity restrains the flowing bloud, and by its tenuity of substance dissolves and discusses the congealed clots thereof. Many reasons of learned Physicians (from whom I have learned this History of Mummy) drawn from Philosophy, whereby they make it apparent, that there can be no use of this or that Mummy in contusions, or against flowing or congealed bloud, I willingly omit; for that I think it not much beneficial to Chirurgeons to insert them here. Wherefore I judge it better to begin to treat of Combustions or Burns.

But hurtful, and how.

The effects of Oxycrate in Contusions.

CHAP. VIII.

Of Combustions and their Differences.

ALl Combustions whether occasioned by Gun-powder, or by scalding Oil, Water, some Metal, or what things soever else, differ onely in magnitude. These first cause pain in the part, and imprint in it an unnatural heat. Which savouring of the fire, leaves that impression, which the Greeks call *Empyreuma*. There are more or less 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, unless 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 hardness. 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 humours from the adjacent and remote parts. These humours presently turn into watrish or serous moisture, whilest they seek to pass 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) and 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 preternatural heat, and repress or keep back the bloud and humours, 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 humours, which yield both begining and matter to the pustules, and so by accident asswage the pain and heat. Refrigerating things are cold Water, the Water of Plantain, Nightshade, Henbane, Hemlock; the juices of cooling Herbs, as Purslane, Lettuce, Plantain, Houseleek, Poppy, Mandrake, and the like. Of these some may be compounded, as some of the fore-named juices beaten with the white of an Egg, Clay beaten and dissolved in strong Vinegar, Roch-Alum dissolved in Water, with the Whites of Eggs beaten therein, Writing-Ink mixed with Vinegar, and a little Camphire, *Unguentum nutritum*, and also *Populeon* newly made. These and the like shall be now and then renewed, chiefly at the first, until the heat and pain be gone. But these same remedies must be applied warm, for if they should be laid, or put to cold, they would cause pain, and consequently defluxion; besides also, their strength could not pass, or enter into the part, or be brought into action; but so applied they asswage pain, hinder inflammation and the rising of blisters.

The reason and symptoms of Combustions.

The cause of the blisters rising upon Burns.

Variety of Medicins to take away the heat and asswage the pain

CHAP. IX.

Of hot and attractive Medicins to be applied to Burns.

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 daily experience, that the heat of the lightly burnt part vanishes away, and the pain asswaged, if they hold the part which was burnt some pretty while to the heat of a lighted Candle or burning Coals, for the similitude

How fire may asswage the pain of burning.

Beaten Onions good for Burns, and how.

litude cauſeth attraction. Thus the external fire, whileſt it draws forth the fire which is internal 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. Now you muſt note that this Medicin takes no place, if it be once gone into an ulcer, for it would increaſe the pain and inflammation; but if it be applied when the skin is yet whole and not excoriated, it doth no ſuch thing, but hinders the riſing of puſtules and bliſters. *Hippocrates* for this cauſe alſo uſes this kind of remedy in procuring the fall of the *Eſchar*. If any endeavour to gain-ſay the uſe of this remedy by that principle in Phyſick, which ſays, 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 actual moiſture, whereby it comes to paſs that they attract, draw forth, and diſſipate the imprinted heat, and ſo hinder the breaking forth of Puſtules. To conclude, the fire, as we formerly noted, is a remedy againſt the fire. But neither are diſeaſes always 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 fried in Oil of Wal-nuts or Roſes, and applied 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 *Unguentum 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 three or four times in a day and a night, ſo to mitigate the bitterneſs of this pain. But if 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 humour contained in them, not having paſſage forth, acquires ſuch acrimony that it eats the fleſh which lieth under it, and ſo cauſeth hollow ulcers: So by the multitude of cauſes and increaſe of matter the inflammation groweth greater, not onely for nine days (as the common people prattle) but for far longer time; alſo ſomewhiles for leſs time, if the body be neither replete with ill humours, 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. ℞ *Mucagin. pſillii & cydon. an.* ℥ iv. *gummi trag.* ℥ ij. *extrahantur cum aqua parietaria, olei liliorum* ℥ ij. ß. *cerae novae 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 Vinegar, or *nutritum*, compoſed after this manner. ℞ *Litharg. auri* ℥ iv. *ol. roſat.* ℥ iij. *ol. de papaver.* ℥ ij. ß. *ung. populeon.* ℥ iv. *camphorae* ℥ j. *fiat unguentum in mortario plumbeo ſecundum artem.* Or Oil of Eggs 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 Eggs hard roaſted. Or ℞ *Butyri recent. ſine ſale, undulati, & colati* ℥ vj. *vitell. ovor.* iv. *ceruſ. lotae in aqua plantag. vel roſar.* ℥ ß. *tuthiae ſimiliter lotae* ℥ 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* ℥ iv. *pul. ceruſ. & tuthiae praepar. an.* ℥ j. *cerae albae quantum ſufficit. fiat unguentum molle ſecundum artem.* But the quantity of drying Medicins may always be increaſed 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 Lin-ſeeds, of the ſeeds of *Pſillium*, or Flea-wort, and Quinces extracted in Roſe-water, or fair water, with the addition of a little Camphire; and leſt that it dry too ſpeedily, add thereto ſome Oil of Roſes. Alſo five or ſix yolks of Eggs mixed with the mucilages of Lin-ſeed, the ſeed of *Pſillium*, and Quinces often renewed, are very powerful to aſſwage pain. The Women which attend upon the people in the Hoſpital in *Paris*, do happily uſe this Medicin againſt Burns. ℞ *Lard. conſciſſi libram unam*; let it be diſſolved in Roſe-water, then ſtrained through a linnen-cloth, then waſh it four times with the Water of Henbane, 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 ſomewhat a coarſe cloth, and ſo alſo the matter may eaſily come forth, and the Medicins eaſily enter in. Alſo you muſt have a care when the eye-lids, lips, ſides of the fingers, neck, the arm-pits, 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 painful than ſuch as are but onely ſuperficiary. The truth hereof you may perceive by the example of ſuch as have their limbs cut off, and ſeared and cauterized with an hot Iron: for preſently after the cauterizing 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 humours which lie under it may enjoy freer perſpiration, and emollient Medicins may the freelier enter in, ſo to ſoak, moiſten and ſotten 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

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 Hoſpital of *Paris*.

Why deep combuſtions are leſs painful than ſuperficiary.

juſtly

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 stubbornness and gentleness of Diseases. After a Burn the Scar which remaineth is commonly rough, unequal, and ill-favoured: therefore we will tell you in our Treatise of the Plague, how it must be smoothed and made even.

I must not here omit to tell you, that Gun-powder set on fire doth often so penetrate into the flesh, not ulcerating or taking off the skin, and so insinuate and throughly fasten it self into the flesh by its tenuity, that it cannot be taken or drawn out thence by any remedies, no not by *Phœnigmes*, nor Vesicatories, nor Scarification, nor Ventoses, nor Horns, so that the Prints thereof always 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 Gun-powder cannot be taken away.

CHAP. X.

Of a Gangrene and Mortification.

CErtainly the malign symptoms 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 than a Gangrene, as that which may cause 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 the Cure. Now a Gangrene is a certain disposition, and way to the mortification of the part, which it seizeth upon, dying by little and little. For when there is a perfect mortification, it is called by the Greeks *Sphacelos*, by the Latins *Syderatio*, our Countrey-men term it the Fire of S. *Anthony*, or S. *Marcellus*.

Gal. 2. ad Glaucon.

CHAP. XI.

Of the general and particular causes of a Gangrene.

THe most general cause of a Gangrene is, when by the dissolution of the harmony and joint temper of the four first qualities, the part is made unapt to receive the Faculties, the Natural, Vital, and Animal 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 dies. Now the particular causes are many: and these either primitive or antecedent. The primitive or external are combustions caused by things either actually or potentially burning; actually, as by Fire, scalding Oil, or Water, Gun-powder fired, and the like. But potentially by acrid Medicins, as Sublimate, Vitriol, potential 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 Aer.* to call great refrigerations of the Brain *Sphacelisin*. 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 replete with ill humours, 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 four prime qualities which we formerly mentioned, and so infer a Gangrene.

The general cause of a Gangrene.

The particular causes.

Cold causeth a Gangrene.

CHAP. XII.

Of the Antecedent Causes of a Gangrene.

NOw the Antecedent or Internal and Corporeal causes of a Gangrene, are plentiful and abundant defluxions of humours, 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 humours, it comes to pass 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 uncurable when the influx of humours first takes hold of the Bones, and inflammation hath its beginning from them. For in the opinion of *Galen*, all these kinds of affects which may befall the flesh, are also incident to the bones. Neither onely a Phlegmon or Inflammation, but also a rottenness and corruption 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 quality we can scarce express by any other name than poison 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 moistned 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 *Erysipelas* 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 Gan-

How defluxions cause a Gangrene.

An uncurable Gangrene.

Lib. de tumor. præter natur.

Aph. 5. sect. 6.

A Gangrene by efflux of a cold matter.

Gangrene, no pain, tumor, blackness, nor any other precedent sign of a Gangrene going before. For *John de Vigo* saith, that happened to a certain Gentlewoman of *Genoa* under his cure.

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 suddenly in the night time a Gangrene seized on both his legs, caused a mortification without tumour, without Inflammation; onely 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 did thrust your Lancet into the skin no bloud came forth. A Council of Physicians 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 bloud; wherefore this remedy, as also divers other, proved to no purpose; for in conclusion, a blackish colour coming into his face and the rest of his body, he died frantick. I leave it to the Readers judgment, whether so speedy and suddenly cruel 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 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 travel in great Snows, and over Mountains congealed, and hoared 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 find 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 predominant Cold their Enemy; whereby it cometh to pass, 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 go. Wherefore thinking onely 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 half his leg. Wherefore after he was carried to the Hospital, 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 died within three days, with troublesom belching and hicketing, raving, cold sweat, and often swounding. Verily all that same Winter the Cold was so vehement that many in the Hospital of *Paris*, lost the wings or sides of their nostrils, seized upon by a mortification without any putrefaction. But you must note that the Gangrene which is caused by cold, doth first and principally seize 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 Ears.

What parts are usually taken by a Gangrene proceeding of cold.

CHAP. XIII.

Of the Signs of a Gangrene.

Sett. 2. lib. de fractur.

What a pulsifick pain is.

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* shews where he speaks of the Gangrene of a broken heel. I would have you here to understand the pulsifick pain, not onely to be that which is caused by the quicker motion of the Arteries, but that heavy and pricking which the contention of the natural heat doth produce by raising a thick cloud of vapours from these humours which the Gangrene sets upon. The

Signs of a Gangrene proceeding from cold.

signs of a Gangrene caused by cold, are, if suddenly 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 accidental heat which was in the part, presently cold and numbness shall possess it, as if it were shook with a Quartan Fever. Such cold, if it shall proceed so far as to extinguish the native heat, bringeth a mortification upon the Gangrene; also oft-times Convulsions and violent shaking of the whole body, are wondrous troublesome to the Brain and the Fountains of life. But you shall know Gangrenes caused by too strait

Signs of a Gangrene proceeding from strait bandages, or ligatures, &c.

bandages, by fracture, luxation, and contusion, by the hardness which the attraction and flowing down of the humours 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 burden 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 from this, that the skin cometh from the flesh without any manifest cause.

Signs of a Gangrene occasioned by a bite, puncture, &c.

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 humours 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 residing in the part. For oft-times the affected parts are in this case moved not by the motion of the whole Muscle, but onely by means,

that

that the head of the Muscle is not yet taken with the Gangrene: which moving it self by its own strength, also moves its proper and continued tendon and tail though dead already; wherefore it is ill to make any delay in such cases.

CHAP. XIV.

Of the Prognosticks in Gangrenes.

HAving given you the signs and causes to know a Gangrene, it is fit we also give you the Prognosticks. The fierceness and the malignity thereof is so great, that unless it be most speedily withstood, the part it self will die, 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 poison, and like fire eats, gnaws, and destroys all the neighbouring parts, until 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 unless that be done, the living will die 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 hickettings molest them, and often swoundings invade them by reason of the vapours abundantly and continually raised from the corruption of the humours and flesh, and so carried to the bowels and principal parts by the Veins, Nerves, and Arteries. Wherefore when you have foretold these things to the friends of the Patient, then make haste to fall to your work.

Why a Gangrene is called *Esthiomenos.*

The quick, impatient of the dead.

CHAP. XV.

Of the general 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 possess the whole member, others onely some portion thereof; some are deep, others some superficial onely. Also you must have regard to the temper of the body. For soft and delicate bodies, as of Children, Women, Eunuchs, and idle persons require much milder Medicins than those who by Nature and Custom, 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 general, 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 easilier 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 internal cause, he must have a diet prescribed for the decent and fitting use of the six things not Natural. If the body be plethorick, or full of ill humours, you must purge, or let bloud by the advice of a Physician. Against the ascending up of vapours to the noble parts, the heart must chiefly be strengthened with Treacle dissolved in Sorrel or *Carduus* Water, with a bole of Mithridate, the Conserve of Roses and Bugloss, and with Opiates made for the present purpose according to Art; this following Apozeme shall be outwardly applied to the region of the heart. ℞ *Aquæ Rosar. & nemphar. an.* ʒ iv. *aceti scillitici*, ʒ j. *corallorum, santalorum alborum & rubrorum, rosar. rub. in pulver. redactarum, & spodii, an.* ʒ j. *mithrid. & theriacæ, an.* ʒ ij. ß. *trochiscorum de Caphora* ʒ ij. *flor. cardiac. in pollin. redactarum, p.* ij. *croci* ʒ j. *Ex omnibus in pollinem redactis, fiat Epithema.* Which may be applied upon the region of the heart with a scarlet cloth or sponge. 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 cordial *Epithema.*

CHAP. XVI.

Of the particular Cure of a Gangrene.

THe cure of a Gangrene caused by the too plentiful and violent defluxion of humours suffocating the native heat, by reason of great Phlegmons is performed by evacuating and drying up the humours, 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 enjoy the benefit of perspiration; and the contained humours of distilation, or evacuation, of their sooty excrements. Let Incisions be made when the affect is great, deep in, and near to mortification. But Scarifications may be used when the part first begins to putrefie, for the greatness 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, unless 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 less, we must rest satisfied with onely scarifying it. When the Scarifications and Incisions are made, we must suffer much bloud 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, cleansing and opening, amend and correct the putrefaction, and by piercing to the bottom may have power to overcome the virulency already impact in the part. For this purpose, Lotions made

The cure of a Gangrene made by inflammation.

of the Lie of the Ashes of Fig-tree, or Oak, wherein Lupins have been throughly boiled, are good. Or you may with less 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 Vitriol are singular Medicins for a Gangrene. Or ℞ *Acet. optimi* ℔ j. *mel. ros.* ʒ iv. *syrup. acetosi* ʒ iij. *salis com.* ʒ v. *bulliant simul, adde aquæ vitæ,* ℔. ſ. Let the part be frequently washed with this Medicin, for it hath much force to repress Gangrenes. After your Lotion, lay *Ægyptiacum* for a Liniment, and put it into the Incisions, for there is no Medicine more powerful 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 Scissers, whatsoever thereof you can, and then put to it *Ægyptiacum* as oft as need shall require. The knowledge 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 tried in these causes, is this. ℞ *Floris æris, aluminis roch. mellis com. an.* ʒ iij. *aceti acerrimi* ʒ v. *salis com.* ʒ j. *vitrioli Rom.* ʒ ſ. *sublimati pul.* ʒ 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, cleanses and dries up the virulent *sanies*, and by the dry subtlety of the parts penetrates into the member, strengthens it, and assuages the pain. ℞ *Farin. fabar. hordei orobi, lent. lupin. an.* ℔ ſ. *sal. com. mellis rosat. an.* ʒ iv. *succi absinth. marrub. an.* ℥ j. ℔. *aloes, mastiches, myrrhæ, & aquæ vit. an.* ʒ ij. *oxymelitis simpl. quantum sufficit; fiat Cataplasma molle secundum artem;* Somewhat higher than the part affected, apply this following astringent, or defensative, to hinder the flowing down of the humours into the part, and the rising up of the vapours from the putrid part into the whole body. ℞ *Olei rosati, & myrtill. an.* ʒ iv. *succi plantag. solani, sempervivi an.* ʒ ij. *album.ovorum* v. *boli armeni, terræ sigillatæ subtiliter pulverisatorum, an.* ʒ 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 yield 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 Leck with Salt beaten and dissolved therewith, for that this Medicine hath a piercing and dryipg 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 exquisitly extreme remedies are best to be applied. 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 may know a perfect and absolute mortification.

CHAP. XVII.

The signs of a perfect Necrosis, *or Mortification.*

A note concerning the unsensibleness of the part.

YOu shall certainly know, that a Gangrene is turned into a Sphacel, 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 press 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 Sphacel) 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 loss 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 deceitful, as that which proceeds rather from the strong apprehension of great pain which formerly reigned in the part, than from any faculty of feeling as yet remaining. A most clear and manifest argument of this false and deceitful sense appears after the amputation of the member; for a long while after they will complain of the part which is cut away.

A wondrous sympeom.

Verily it is a thing wondrous strange and prodigious, and which will scarce be credited, unless 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 special care lest this hinder your intended amputation; a thing pitiful, 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 Sphacel 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.

Sect. 7. lib. 6. Epidem.

CHAP. XVIII.

Where Amputation must be made.

The controversie decided.

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 found as much as in us lies.

I will shew thee by a familiar example how thou mayest carry thy self in these difficulties. Let us suppose, that the foot is mortified even to the ankle; 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, and all manner of injury, that which injoyeth life and health. Wherefore you shall cut off as little of that which is sound 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- *Lib. 7. cap. 33.*
times the commodity of the action of the rest of the part, and as it were a certain ornament thereof, changes this counsel. 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 bredth under the Knee. For so the Patient may more fitly use the rest of his leg and with less 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.

For I so knew Captain *Francis Clark*, 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 found, he caused the rest thereof to be cut off, some five fingers bredth below his Knee; and verily he used 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 found part as you can. For the actions of the legs much differ from those 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.

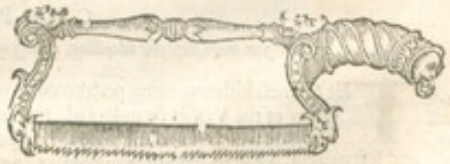
CHAP. XIX.

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 Eggs, and Bread tosted and dipped in Sack or Muskadine. Then let him be placed as is fit, and drawing the Muscles upwards towards the found parts, let them be tied 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 perfor- The Ligature of the part.
mance of the work, they may cover the ends of the cut bones, and serve them in stead of bolsters or pillows when they are healed up, and so suffer with less 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 skin or flesh 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 animal spirits by the strait compressing being hindered from passing in by the Nerves. Wherefore when you have made your ligature, cut the flesh even to the bone with a sharp and well-cutting incision-knife, or with a crooked knife, such as is here expressed.

A crooked Knife fit for dismembring, or a dismembring Knife.

The Figure of such a Saw.



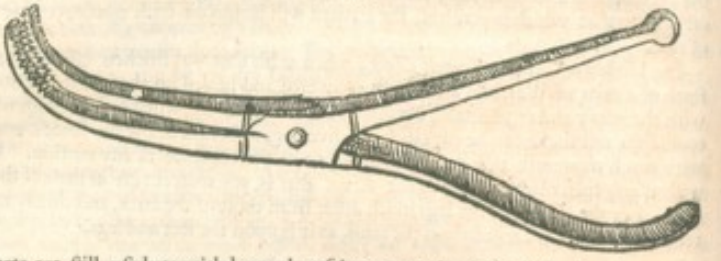
Now you must note, that there usually lies between the bones, a portion of certain muscles which you cannot easily cut with a large incision or dismembring knife; wherefore you must carefully di- A Caution to be observed.
vide it and separate it wholly from the bone, with an instrument made neatly like 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 soft 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 found flesh as you can. And then you must smooth the front of the bone which the Saw hath made rough.

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 leſs obnoxious to inflammation and other ſymptoms; Then let the Veins and Arteries be bound up as ſpeedily and ſtraitly as you can; that ſo the courſe of the flowing bloud may be ſtopped and wholly ſtaid. Which may be done by taking hold of the Veſſels with your Crows-beak, whereof the Figure follows.

The Crows-beak fit for to draw the Veſſels forth of the fleſh, wherein they lie hid, that ſo they may be tied or bound faſt.



How to draw forth the Veſſels and bind them.

The ends of the Veſſels 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 withdraw themſelves, as all parts are ſtill uſed to withdraw themſelves towards their originals. In performance of this work, you need take no great care, if you together with the Veſſels comprehend ſome portion of the neighbouring parts, as of the fleſh, for hereof will enſue no harm; but the Veſſels will ſo be conſolidated, with more eaſe, than if they being bloudleſs 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 bloud is ſtanched, you muſt dreſs the wounded member.

How the lips of the diſmembred part are to be joined together.

WHen you have the tied Veſſels, looſe your Ligature which you made above the place of amputation, then draw together the lips of the Wound with four ſtitches made acroſs, 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 leſs 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 lie 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 Veſſels chance to get looſe.

The Hæmorrhagy of ſmall Veſſels is not to be regarded.

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 leſs painful, let your ſervant take hold of the member with both his hands, preſſing his fingers ſtrait, ſtop the paſſage of the looſed Veſſel, for ſo he may ſtanch the bleeding. Then let the Workmaſter 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 Veſſel after the following manner. Let him thruſt his Needle on the outſide into the fleſh, ſome half fingers bredth from the looſed Veſſel until 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 bredth 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 ſtraight 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 oriſice of the Veſſel will in ſhort ſpace be agglutinated to the adjoyning fleſh, and that ſo firmly, that there hath never been ſeen any one drop of bloud to have flowed from a Veſſel ſo bound up. But if the bloud which flows forth proceed from any ſmall Veſſel, you muſt not uſe this future and ligature, nor make any ſuch great matter thereof, for it will quickly be ſtanched by the onely application of Aſtringents, preſently to be mentioned.

CHAP.

CHAP. XXIII.

How to perform the residue of the Cure of the amputated Member.

NOw must we shew what Medicins are fitting to be applied after the amputation of a member; which are Emplasticks, as those which exceedingly conduce to green Wounds. As, ℞ *Bol. arm.* ʒ iv. *farin. vol.* ʒ iij. *picis, resinæ, an.* ʒ ij. *pulverisentur omnia subtilissimè & simul mixtis fiat pulvis*; herewith let the Wound be strewed, and lay thereupon dry Lint; but let the following repercussive or defensative be applied to the member. ℞ *Albumen ovorum* vj. *boli arm. sang. drac. gypsi, terræ sigill. aloes, masticbes, gallar. combust. an.* ʒ ij. *in pollinem redigantur omnia, & bene agitentur, addendo olei rosarum & myrtill. an.* ʒ j. *fiat defensativum ad formam mellis.* This ointment must be applied upon stoops dipped in Oxycrate, and that so that it may not onely cover the cut member, but also be spred further and cover the neighbouring parts; as when the Leg is cut off, it must be laid upon the joint, and spred higher than the Knee, some four fingers upon the Thigh, for it hath not onely a repercussive faculty, but it also strengthens the part, hinders the defluxion by tempering the bloud, asswaging pain, and hindering 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 husks or chaff, Stags hair, or Wheat bran. It must not be stirred after the first dressing (unless great necessity urge) for four days in Winter, but somewhat sooner in Summer. For the ligatures wherewith the Vessels are bound, they must not be loosed, or otherwise taken away, before the mouths of the Vessels are covered with their glue or flesh, lest by too much haste you cause a new flux of bloud. This agglutination will be performed by applying refrigerating, astringent, and emplastick Medicins, such as this following powder. ℞ *Boli arm. farin. hord. picis, res. gypsi, an.* ʒ iv. *Aloes, nucum cup. cort. granat. an.* ʒ j. *incorporentur omnia simul, fiat pulvis subtilis:* herewith let the whole Ulcer be strewed over for three or four days space; which being ended, let onely the seats of the Vessels be powdred therewith, and that for eight or ten days, so that we need no further doubt of the agglutination of the Vessels. In the mean space let the digestive be applied to the rest of the Ulcer until it be come to suppuration; for then you shall give over your digestive, and betake to your detersive and mundificative Medicins: As ℞ *Terebinth. ven. lotæ in aqua vitæ* ʒ vj. *mellis ros. colati* ʒ iv. *succi plantag. Apii, centaur. minoris, an.* ʒ ij. *bulliant omnia simul usque ad consumptionem succorum, auferantur ab igne, addendo farinæ fab. & hord. an.* ʒ j. *theriac. Gal.* ʒ ß. *aloes, myrrhæ, aristoloch. an.* ʒ iij. *croci* ℈ j. *fiat mundificativum.* But seeing the case stands so that the Patients imagine 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 original, 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 endeavour to give remedy to this symptom. 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. ℞ *Salviæ, chamæpithyos, majoranæ, rorismar. menth. rutæ, lavendulæ, an. m.* j. *flor. chamæmel. melilot. summit. aneth. & hyperici, an. p.* ij. *baccarum lauri & juniperi, an.* ʒ ij. *radicis pyrethri* ʒ ij. *mastic. asse odorat. an.* ʒ i. ß. *terebinth. venet.* ℔ j. *olei lumbr. aneth. catell. an.* ʒ vj. *olei terebinth.* ʒ iij. *axung. hum.* ʒ ii. *croci* ʒ j. *vini albi odoriferi* ℔ 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* ʒ iv. 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 actual Cauteries, that is, hot irons; in using of which you must have a special care that you touch not the sensible parts with fire; neither must the bones themselves be forcibly plucked off, but gently moved by little and little, so that you shall think that 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 cathereticks, such as are burnt Vitriol, the Powder of Mercury, and other things, amongst which is Alum burnt and powdered, which is excellent in these kinds 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 it self.

An emplastick Medicin. A repercussive

How to place the member and how often to dress it.

An emplastick Powder.

Detersives.

Why after dismembring the Patients complain of pain as if the part was 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.

Cathereticks.

CHAP. XXIV.

What just occasion moved the Author to devise this new form of remedy, to stanch the bloud after the amputation of a member, and to forsake the common way used almost by all Chirurgeons; which is by application of actual 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 aggrieved; But what should I do? I had observed my Masters, whose Method I intended to follow, always to do the like; who thought themselves singularly well appointed to stanch a flux of bloud, 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 horrour, much less acted. For this kind of remedy could not but bring great and tormenting pain to the Patient, seeing

Hot Irons not to be used.

seeing such fresh wounds made in the quick and sound flesh, are endued with exquisite sense: Neither can any caustick be applied to nervous bodies, but that this horrid impression of the fire will be presently communicated to the inward parts; whence horrid symptoms ensue, and oft-times death it self. And verily of such as were burnt, the third part scarce ever recovered, and that with much ado, for that combust Wounds difficultly come to cicatrization; for by this burning are caused cruel pains, whence a Fever, Convulsion, and oft-times other accidents worse than these. Add 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 loss 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 artificial leg or arm, in stead of that which was taken off. Wherefore I must earnestly intreat all Chirurgeons, that leaving this old and too too cruel way of healing, they would embrace this new, which I think was taught me by the special 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: Onely I have read in *Galen* that there was no speedier remedy for stanching of bloud than to bind the Vessels (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 practice thereof, I always had my Cauteries and hot Irons in a readiness, that if any thing happened otherwise than I expected in this my new work, I might fetch succour from the ancient practice; until 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 Custom in such things as are performed by Art, ought not to have any sway, authority or place contrary to reason, as they oft-times have in civil affairs; wherefore let no man say unto us, that the Ancients have always done thus.

Lib. 5. Meth.

CHAP. XXV.

The practice 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. Whilest I was a Chirurgeon to the Marshal 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 seized 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, hicketings, watchings, unquietness, and frequent swoundings, which occasioned many Chirurgeons to leave him as desperate. But it so fell out, that I (overcome 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 onely with an Incision-Knife, cutting in sunder the ligaments which held the bones together, because the sphacel 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, and that there is nothing to be feared therein besides swounding, by reason of the pain caused by cutting the common tendons and ligaments. But such incision being made, the former ligature could not hinder, but much bloud must flow from thence, by reason of the large Vessels that run that way; Wherefore I let the bloud 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 bloud with an hot Iron, for as yet I knew no other course. Then (gently loosing the ligature) I scarified that part of the brawn of the Arm which was gangrenated, with many and deep incisions, shunning and not touching the inner part, by the reason of the multitude of the large Vessels and Nerves which run that way; then I presently applied 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 applied Epithemaes to the region of the heart, and gave him cordial potions and boles, neither did I desist from using them until such time as his belching, hicketing, and swoundings had left him. Whilest 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 naughtiness 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 Chafingdishes, 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 straitway I wrapped him in a warm linnen cloth, and buried him even to the neck in hot dung, putting

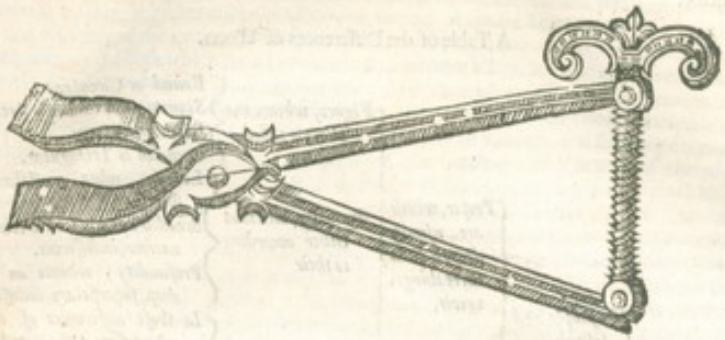
Dismembring at a joint.

Sect. 4. Lib. de Art.

Burying in hot horse-dung helps Convulsions.

ting a little fresh straw about him; when he had staid there some three days, having at length a gentle scouring or flux of his belly, and plentiful 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 business, I opened his mouth as much as I pleased, by putting this following Instrument between his teeth.

A Dilator 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 thereof, that so I might the more easily feed him with meats soon made, as with Cows milk and rear Eggs, until 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 actual Cautery seared the end of the bone, so to dry up the perpetual afflux of corrupt matter. It is not altogether unworthy of your knowledge, that he said, how that he was wondrously delighted by the application of such actual cauteries, a certain tickling running the whole length of the arm by reason of the gentle diffusion of the heat by the applying the cautick; which same thing I have observed in many others; especially in such as lay upon the like occasion in the Hospital 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 pass, that by Gods, assistance these means I used, and my careful 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.

BOOK XIII.

Of Ulcers, Fistulaes, and Hæmorrhoides.

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 bloudy 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 dried 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 bloudy, but sordid and impure, 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 it you in fewer words according to *Galens* opinion; An Ulcer is a solution of Continuity, caused by Erosion. The causes of Ulcers are either internal or external. The internal are through the default of humours 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 disposure. The external causes are, the excess of cold seizing

The diverse acceptions of an Ulcer. *Sect. 24. sect. 3. lib. de fract.*

Sect. 1. prog.

What an ulcer properly is.

Lib. de constit. Artis cap. 6.

The internal causes.

The external causes.

seizing upon any part, especially more remote from the fountain of heat, whence follows pain, whereunto succeeds an attraction of humours 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 external causes may be ranged, a stroke, 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.

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; when 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 accidental, and these drawn either*
    - *From their time; whence an Ulcer is termed new, old, of short or long, cure and curation.*
    - *From their appearance; whence one is called an apparent Ulcer, another a hidden and occult Ulcer.*
    - *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 Ulcer.*
    - *From their Site; whence an Ulcer before, behind, above, below in the head, tail, or belly of a Muscle.*
    - *From that part it seizes upon; whence an Ulcer 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 Ulcer, that is, such an Ulcer as* Telephus *had. A Chironian, which needs the hand and art of* Chiron. *A Cancerous which resembles a Cancer.*
- *Is Compound, and many and various ways complicated, as*
  - *With the cause whence an Ulcer*
    - *Is Cacochymick, Catarrhoick or venenate, that is, which a* Cacochymia *or Repletion of ill humours, a Catarrh, or poison cherishes or feeds.*
  - *With the Disease, as from*
    - *Distemper, whether simple or compound, whence an Ulcer is*
      - *Hot.*
      - *Cold.*
      - *Dry.*
      - *Moist.*
      - *Mixt.*
    - *Swelling or Tumour, whence a*
      - *Phlegmonous*
      - *Erysipelous*
      - *Oedematous*
      - *Scirrhous*
      - *Cancrous*

      Ulcer.
    - *Solution of Continuity, or any other discommodity, whence a rough, callous, fistulous, cavernous, sinuous Ulcer, with luxation, fracture, &c.*
  - *With the Symptom, whence a corroding, eating, painful, sordid and virulent Ulcer.*
  - *With the cause and disease,*
    With the cause and Symptom,
    With the disease and Symptom,
    With the cause, disease and Symptom.

    Examples whereof may be taken from that we have formerly delivered.

CHAP.

CHAP. II.

Of the Signs of Ulcers.

THere are various signs of Ulcers according to their differences. For it is the sign of a putrid Ulcer, if it exhale a noisom, grievous, stinking and carion-like vapour, together with filthy matter. An eating Ulcer is known by the eating in, hollowness and wearing away of the part wherein it resides, together with the adjoining parts. A sordid Ulcer may be known by the grosness and viscidity of the excrements it sends forth, and by the loose and spongy softness, or the crusted inequality of the flesh which grows over it. A cavernous Ulcer, by the straitness of the orifice, and largeness and deepness of the windings within. A fistulous Ulcer, if to the last mentioned signs there accrew a callous hardness of the lips or sides of the Ulcer. A cancrous Ulcer is horrible to behold, with the lips turned black, hard and swollen; flowing with virulent and stinking corruption, and sometimes also with bloudy matter, together with the swelling and lifting up of the adjacent Veins. An untemperate, or as they term it, a distempered Ulcer, 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 Ulcer is known by the difficulty of curing and rebellious contumacy to remedies appointed according to Art and Reason. We know a catarrhous Ulcer, 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 Apostematous Ulcer is perceived by the presence of any tumor against Nature, whose kind may be found out by sight and handling. *Telephian* Ulcers are such as affected *Telephus*; and *Chironian* (in whose cure *Chiron* excelled) are Ulcers 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 swollen 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 Ulcer 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 humour, and that such as can scarce be driven away; such commonly are felt after the Plague. Wherefore *Galen* thinks such to be malign as will not suppurate or yield any quitture.

The signs of a putrid Ulcer

Gal. cap. 5. lib. 4. Meth.

* *ulcus Cacoethes.*

Com. ad aphor. 22. sect. 5.

CHAP. III.

Of the Prognosticks of Ulcers.

THe bone must necessarily scale, and hollow scars be left by malign Ulcers of a years continuance or longer, and rebellious to Medicins fitly applied. The bone must scale by reason of the continual efflux, and wearing by the acrimony of the humour, 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 original) or some portion thereof, being taken from under the flesh, as the foundation thereof, so much of the bulk of the flesh must necessarily sink down, as the magnitude of the portion of the wasted bone comes unto.

Aph. 45. sect. 6.

You may know that death is at hand, when the Ulcers that arise in or before diseases, are suddenly either livid or dried, or pale and withered. For such drinesss 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 onely an argument of the over-abundance 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 original are free from the noxious humours. But these tumors suddenly 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 fore-part of the body is replenished and over-spread with many and large Vessels, into whose passages the morbinck matter being translated, is presently carried to those 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 humours, 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 humour malign by its acrimony, which frets asunder the roots of the hairs, and depraves the natural construction of the pores of the skin; whence it is, that such as are troubled with Quartan 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 original and integrity.

Hipp. progn. lib. 1. cap. 8. Aph. 65. sect. 5.

Aph. 57. sect. 5.

Aph. 4. sect. 6.

Those Ulcers which happen by occasion of any Disease, as a Dropsie, are hard to be cured; as also those whereinto a *varix* or swollen Vessel continually casts in matter, which a present distemper forments; which have swollen, 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 humours, 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 bloud, in a bloudless body; the second, by reason of

Hip. lib. de ulc. Gal. cap. 2. & 5. lib. Meth. 4.

For what causes Ulcers are hard to heal.

of ill humours and the impurity of the bloud; 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 original from a common cause which every where rages with fury, such as are those which are left by the pestilences; the seventh, 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 fuel to the continuance of the Ulcer, as at *Saragosa* in *Aragon*; the ninth, when the bones which lie under it are wasted by rottenness. An Ulcer that casts forth white, smooth, equal 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 term that smooth quitture which is absolutely concocted, neither yields any asperity to the touch, whereby we might suspect that as yet any portion of the humour remains crude; we call that equal, wherein you can note no diversity of parts; and 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 bloud suddenly break forth in those Ulcers which beat strongly by reason of the great inflammation adjoined therewith. For, as *Hippocrates* observes, an effusion of bloud happening upon a strong pulsation in Ulcers is evil; for the bloud breaking out of an Artery cannot be staid but by force, and also this bloud 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 flows two sorts of excrements from malign Ulcers, the more thin is termed *Ichor* or *Sanies*, but the more gross is named *Sordes*, that is virulent and flows from pricked Nerves, and the *Periostea* when they are evil affected; but the other usually flows from the Ulcers of the joints, and it is the worser, if it be black, reddish, ash-coloured, if muddy or unequal like Wine Lees, if it stink. *Sanies* is like the Water wherein flesh hath been washed; it argues the preternatural heat of the part; but when it is pale coloured it is said to shew the extinction of the heat.

What Pus or Matter is smooth, equal, and white. *Ad sentent. 32. sect. 2. de fract. Aph. 21. sect. 7.*

Two sorts of excrements flow from a malign Ulcer.

CHAP. IV.

Of the general Cure of Ulcers.

The curing of a simple Ulcer consists in exsiccation. *Gal. 7. Meth. cap. 12.*

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 unless it be taken away, the Ulcer cannot be healed. By giving you an example you may easily understand the meaning hereof. Imagine on the inside of the leg, a little above the ancle, an Ulcer very painful, hollow, putrid, associated with the rottenness of the bone, circular, having hard and swollen 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, unless you be called upon by that which urges, as by vehemency of pain, you must first use general means by calling and advising with a Physician. 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 onely will be sufficient, in some bloud-letting, others are better by using both means, which is as the cause of the Ulcer proceeds from a repletion or illness of humours. Now by these means having taken away the cause of the Ulcer, 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 proceeded 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 humours; then shall you draw away a 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 *Ungnentum 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 pass 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 Ulcer, to wit, the rottenness of the bone, which you shall help by actual cauteries; and in the mean while you shall draw the Ulcer into another form, to wit, cornered, and you shall cut away the callous hardness, and help the rottenness; 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 Ulcer must be filled with flesh. For generating of flesh two causes must concur, the efficient, and material; the efficient is, the good temper both of the whole body, as also of the ulcerated part. For, this prevailing, there will be an attraction, digestion, opposition and assimulation 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 bloud, 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 gross 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 humour, and the uncleanness of the Ulcer. For the part must be preserved by the use

Gal. lib. 4. de comp. med. secund. gen.

The things conducing to the generating of flesh.

use of the like, but the Ulcer overcome 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 Vitriol being burnt and 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 Quick-silver, whose efficacy for this purpose Chirurgeons sometimes find more certain and powerful than any other remedies.

What a Scar is.

Things causing cicatrization.

CHAP. V.

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 always you must first purge, if the body shall abound with ill humours, or use Phlebotomy if the body be plethorick; otherwise you shall draw more humours 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 swollen. If you proceed further, you will resolve all the humour which you have drawn thither, and so your labour is in vain. After the fomentation, apply such a remedy to the ulcerated part. ℞ *Cremoris hordei* ʒ ij. *fol. malvæ in aq. coll.* ʒ j. *pingued. porci* ʒ j. ß. *mellis com.* ʒ ß. *misce in mort. & fiat unguentum.*

Signs of a distempered Ulcer.

Remedies for a dry distempered Ulcer.

You shall know a moist distemper associates the Ulcer by the plenty of the excrementitious humour, which the Ulcer sends forth, by the spongy and fungous softness and growth of the flesh about it. You shall amend this by drying remedies, such as those are, which we term Sarcoticks, having always regard to the plenty of the humour, the proper temper of the part, and other indications formerly mentioned. Amongst other remedies *Galen* much commends Alum Water, for it dries, cleanses and corroborates the affected part. Also this ensuing fomentation may be applied to good purpose. ℞ *Rosar. rub. absinth. beton. tapsi barbati an. m.* j. *gallarum, nucum cupressi, an.* ʒ ij. *aluminis rochæ* ʒ j. *fiat decoctio in vino austero, instituatur fotus.* Then let *Empl. de cerussa* or *de minio* be applied to the Ulcer. Also I have found by experience that the Powder of burnt Alum lightly strewed upon the Ulcer is very effectual in this case. You shall know that an hot distemper associates the Ulcer by the redness or yellowness 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 cloths dipped in Plantain Water, Nightshade Water, or Oxycrate. I have oft found by experience that scarification, or Leaches being applied, 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 felt is also freed of that burden.

Gal. lib. 1. *simp. cap.* 7.

Signs of a hot distempered Ulcer.

We know a cold distemper by the whitish or pale colour, by the touch of the Chirurgeon, and speech of the Patient complaining of the coldness 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. melilot, an. m.* j. *absinth. majorane, salviæ, rorism. an. m.* ß. *fiat decoctio in vino generoso, addendo aquæ vitæ quod sufficit.* Also the Ulcer may be conveniently fomented with Sponges dipped in the same decoction, and let there be applied 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.

Signs of a cold distempered Ulcer.

CHAP. VI.

Of an Ulcer with pain.

THere oft-times so great pain accompanieth Ulcers, that it calls thereto the counsel of the Physician. 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, Waterlillies, 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 humour corroding and eating the flesh lying under it and the lips about it, cause and make the pain, you shall neither assuage 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 powerful *Ægyptiacum*, or in a little Oil of Vitriol, be applied to the Ulcer; for these have power to tame this raging pain, and virulent humours. 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 assuage pain.

CHAP.

CHAP. VII.

Of Ulcers, with over-growing or proudneſs of fleſh.

Things waſting ſuperfluous fleſh.

ULcers have oft-times proud or over-growing 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 applied, 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, yield 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 effectual 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 you have for ſome few days uſed ſuch like remedies, you may apply to the Ulcer a plate of Lead rubbed over with Quickſilver, for this is very effectual to ſmooth an Ulcer and depreſs 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.

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.

The cauſe of Worms breeding in Ulcers

WOrms 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 unnatural and immoderate heat. Which happens, either for that the Ulcer is neglected, or elſe by reaſon of the diſtemper and depraved humours of all the body, or the affected part; or elſe for that the excrementitious humour 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 and 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 general means, the Worms muſt firſt be taken forth, then the excrementitious humour muſt be drawn away whence they take their original. 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. ℞ *Abſinth. centaur. majoris, marrubii, an. M. j. fiat decoctio ad* ℔ ß. *in aqua diſſolve aloes* ʒ ß. *unguenti Ægyptiaci* ʒ 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.

A fomentation to kill the Worms.

Achigenes much commends this following Medicin. ℞ *Ceruſæ, polii montani, an.* ʒ 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 powerful, or to Cauteries alſo, or hot Irons, or to Section; yet you muſt ſtill begin with the more gentle, ſuch as this of *Galens* deſcription. ℞ *Ceræ,* ʒ ij. *ceruſæ* ʒ j. *olei roſ.* ʒ ij. *ſalis ammon.* ʒ ß. *ſquam. æris* ʒ ij. *thur. alum. aerug. malicor. calcis vivæ, an.* ʒ j. *fiat emplaſtrum.* Or ℞ *terebinth. lotæ* ʒ ij. *ceræ albæ* ℥ ß. *liquefiant ſimul addendo ſublimati* ʒ ß. *ſalis torrefactis & vitrioli calcinati, an.* ʒ j. *fiat mundificativum.* Or you muſt uſe our *Ægyptiacum* alone, which hath ſublimate entering 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.

Gal. 4. comp. pitch.

CHAP. IX.

Of a Sordid Ulcer.

A Sordid Ulcer after the cure of the body in general, ſhall be healed with detergent Medicins; the Indication being drawn from the groſs 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 powerful, which cauſeth us to begin the Cure with Fomentations and Lotions; as thus: ℞ *Lixivii com.* ℔ j. *abſinth. marrub. apii, centaur. utriuſque, hyperiçonis, an. M. ſſ. coquantur, colaturæ, quæ ſufficiat, adde mellis roſati* ʒ j. *unguenti Ægyptiaci* ℥ ß. *fiat fotus.* Then uſe the following deterſive Medicin: ℞ *Succi apii, & plantag. an.* ʒ ij. *mellis com.* ℥ j. *terebinth.* ℥ j. ß. *pul. Ireos Florent. & aloes an.* ʒ ß. *fiat medicamentum.* The Chirurgeon muſt well

A detergent Lotion.

well consider, at how many dressings he shall be able to wash away the gross *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 gross *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 cleanse without acrimony, that we may so help Natures endeavours in generating flesh. Such remedies are, the powders of Aloes, Mastick, Myrrh, Orris, Litharge, Antimony, roots of Gentian, Barley-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 less strong, as you shall find it requisite and necessary. For the too plentiful use of drying and detersive things, doth in time hollow the Ulcer, whereby it comes to pass that in short time in like sort, a great quantity of *sanies* flows from the Ulcer, the proper substance of the flesh being dissolved by the force or acrimony of detersive medicines; as also the proper alimentary humor, which flowed to the part, being in like sort defiled: Which thing beguiles the unskilful 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 medicines 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 medicine, dissolved the flesh; and so consequently made the Ulcer more hollow, and caused more pain and defluxion; whereby it hapned, that continually adding more acrid medicines, he continually (by his ignorance and unskilfulness) increased the colliquation of the flesh, the largeness of the Ulcer and excrementitious humidity: Wherefore we must take special care whether the sordid Ulcer grows 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 medicine. You may conjecture this by the increase of the pain without reason, and by the heat and redness 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 medicine 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 medicine to a Plow-man or labourer, or to an Eunuch and woman; or whether to the leg or eyes: For these medicines 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 cleanse the flesh in a soft body, and dry up the *sanies*, these same things applied to a hard body, increase the *sordes* and *sanies* by suffer-ing them to breed, neither are they of sufficient power to wash away the tenacious impurity of a dense body. Wherefore the skilful Chirurgeon will see when he must betake himself from too strongly cleansing and eating medicines to these which are more mild.

Detergent medicines 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 termed Cacoethes, *and of a Chironian Ulcer.*

VIrulent and eating Ulcers differ not, unless in *magis* and *minus*, for we term it a virulent Ulcer, which sends forth a virulent *sanies*, which is properly called *Virus*. This *Virus* or virulency, when it becomes more malign, gnaws and feeds upon the parts which lie under, and are adjoyned 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 termed *Cacoethes*; or for that by reason of the evil 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 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 other some, it is also necessary to have divers medicines ready and at hand, distinct both in their faculties and the degrees thereof, so that it is no marvel if they oft fail of their purpose, who with the same medicine dress (and think they shall heal) all malign Ulcers. This following medicine described by *Asclepiades*, is much commended by *Galen*. ℞ *Squammæ æris, aruginis rasæ, an.* ℥ i. *Ceræ* ℔ β. *Resinæ laricis* ℥ i β. *Quæ liquari possunt aridis affundantur*, and make an Emplaister to be laid only upon the Ulcer; for you must lay a defensative about the Ulcer, for fear of inflammation. But *Galen* faith, that the following Epulotick of *Primus* 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. ℞ *Soreos* ℥ iij. *Aluminis scissilis; calcis vivæ, an.* ℥ ij. *Thuris gallarum, an.* ℥ iiij. *Ceræ* ℔ i. & ℥ iij. *Sevi vitulini* ℔ i. & ℥ vij. *Olei veteris quantum sufficit, fiat emplastrum.*

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.*

Gal. lib. 4. See *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.

Gal. lib. 4. de comp. med. See Gen. cap. 5.

TO ſhew the uſe of *Aſclepiades* his medicines, deſcribed in the former Chapter, and convince the error of thoſe Chirurgeons, who think they do well for their Patients, if they twice or thrice on a day dreſs malign Ulcers; I have here thought good to digreſs a little from my purpoſe, and to interpoſe *Galen*'s authority. Rightly (ſaith *Galen*) hath *Aſclepiades* added theſe words to the formerly deſcribed medicine: And looſe this after three days, and foment the Ulcer, and faſten the ſame emplaſter being waſhed, and apply it again; for unleſs the medicine adhere long to the skin, it will do no good. Which thing notwithſtanding many Phyſicians 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 dreſs 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 all neighbouring bodies do mutually actuate and affect each other in ſome degree, although the one thereof be much more powerful; for by this reaſon in ſpace of time they become ſomewhat alike, though they otherwiſe differ much: But when the quality of the medicine ſhall be like the *ſpecies* to the body to be cured, there follows the better ſucceſs. Wherefore he wich moved firſt by theſe reaſons, firſt appointed to uſe the emplaſter formerly applied, 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 powerful medicine, 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 medicines can do nothing in us unleſs by the force of the native heat, which ſtirs up the faculty of the medicine 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 preternatural heat; ſo that it ſtands in need of a great ſpace of time to actuate the virtue and faculty of the medicine Wherefore, if in that time, when as the native heat hath much moved and ſtirred up the faculty of the medicine, the Ulcer be looſed or opened, and that emplaſter caſt away which was laid upon the part, and a freſh one laid inſtead thereof; the heat implanted in the part, is either diſſipated by the contract of the air, or is weakned 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.

Galen's reaſon further explained.

Medicines are only ſuch in faculty.

For all medicines are what they are in faculty. Equal to this is their errour, who by too oft renewing their emplaiſters on the ſame day, do too powerfully cleanſe; for ſo they do not only take away the excrementitious humous, both *ſordes* and *ſanies*, but alſo the alimentary juice; to wit, the *Rob*, *Cambium* and *Gluten*, which are the next matter for procreating of laudable fleſh. Wherefore, it is not good to dreſs Ulcers ſo often in one day, and to looſe them to apply new emplaiſters, unleſs ſome grievous ſymptom (as pain) force us to do it, which requires to be aſſwaged and mitigated by the often changing and renewing of Anodyne medicines.

CHAP. XII.

How to bind up Ulcers.

The beginning of your binding muſt be at the Ulcer.

FOr the binding up of Ulcers, you muſt always 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 preſs the Ulcer with that moderation, that it may only preſs out the excrementitious humors. For ſo the Ulcer will become dry, and conſequently more near 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 rollers 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 lie on a bed. Wherefore, when the legs are ulcerated, the arms muſt be exerciſed, by handling, lifting up and caſting down of divers things. But on the contrary, if the arms be ulcerated, the legs muſt be exerciſed with walking, or fricſtions 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.

Revulſion into contrary parts.

CHAP. XIII.

Of the cure of particular Ulcers, and firſt of thoſe of the Eyes.

4. Meth.

FOr that (in *Galen*'s opinion) the divers Indications in curing diſeaſes are drawn from the condition of the part, to wit, the temper, complexion, ſite, figure, uſe, dull or quick ſenſe; Therefore having briefly handled the general 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, begin-

ning

ning 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 ſtroke.

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 termed *Batryon*; but if it be broader and leſs deep, it is termed *Caloma*; about the circle of the *Iris* or Rain-bow, it is called *Argemon*; if it be crufty and ſordid, it is termed *Epicaumæ*. Theſe in general require the ſame cure as the former, that is, to be mundified, incarnated, dried and cicatrized; but the part affected indicates more gentle medicines. Wherefore having purged the Patient, and taken ſome blood both from his arm, as alſo from his veins and temporal arteries, and bathed him if it be needful, to divert the defluxion, you ſhall to his ſhoulders apply Cupping-glaſſes with Scarifications; or elſe bread newly drawn out of the Oven, and ſprinkled with *Aqua vitæ*; or ſome good Wine ſhall be applied to the original of the ſpinal 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. ℞ *Æris uſti, cadmiæ uſtæ & lotæ, an.* ʒ i. *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 medicines thereto, it will be good to comfort it. Alſo you may make *collyria* of the decoction of Plantain, Fenugreek, Wormwood, with a little quantity of Sugar-candy, *tutia*, gum *tragacanth*, Myrrh and Vitriol diſſolved therein. When the Ulcer is mundified, the following Sarcotick will be of good uſe. ℞ *Sarcocollæ in lacte muliebri tritæ,* ʒ iij. *pul. diaireos ſimplicis. gum. arabici, tragacanth, an.* ʒ ß. *Mucilaginis fœnugræci 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*. ℞ *Tutiæ*; *cadmiæ ut decet præparatæ, ceruſæ, antimonii, olibani, an.* ʒ ß. *Myrrhæ, ſarcocollæ, ſanguinis Draconis, aloes, opii, an.* ℈ ß. *Cum aqua plantaginis fiat collyrium*; or the powder only may be conveniently ſtrewed thereon.

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. ℞ *Papaveris lacrymæ,* ʒ ß. *Sagapeni, opopanacis, an.* ʒ ß. *eruginis* ʒ i. *Cumini* ʒ iij. *Piperis* ʒ ij. *cadmiæ lotæ & ceruſæ, an.* ʒ i ß. *Cum aqua pluviali fiat collyrium.* But if the ſcars be thick or groſs, the following remedy will extenuate them. ℞ *Cinamom. acaciæ, an.* ʒ ß. *Cadmiæ lotæ, croci, myrrhæ, papaveris lacrymæ, gum. arabici, an.* ʒ i. *Piperis albi, thuris, an.* ʒ i ß. *Æris combuſti,* ʒ iij. *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 ſpread over with more little veins than that.

Lib. 6. cap. 6. lib. 3. Batryon, Caloma, Argemon, Epicaumæ.

The cure.

A *collyrium* to cleanſe the ulcers of the eyes.

A ſarcotick *Collyrium.*

An epulotick *Collyrium. Lib. 6. cap. 6.*

A *Collyrium* for hollow ſcars.

The ſcars of the hornycoat are white, and theſe of the *Adnata* red.

CHAP. XIV.

Of the Ozæna *and Ulcers of the Noſe.*

THe *Ozæna* is a deep and ſtinking Ulcer in the inſide of the noſe, ſending forth many crufty and ſtinking excrements: *Celſus* ſaith that ſuch Ulcers can ſcarcely be healed. It is cauſed (as *Galen* ſaith) by the diſtillation of acrid and putrid humors from the head into the noſtrils 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 dried and ſtrengthned, 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 dried with a repelling medicine; ſuch as is the juice of Pomegranats boiled to the half in a braſs veſſel; 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 noſtrils the juice of Calamint, or that the Calamint it ſelf being dried, and made into powder, may be blown with a quill into the noſe. Others uſe this following powder. ℞ *Roſ. rub. mint. calam. arom. rad. angelicæ, gentian. macis, caryop. an.* ʒ ß. *Camph. ambræ, an. gr.* iij. *Moſch. gr.* vj. *fiat pulvis ſubtiliſſimus. Manardus* writes, that the urine of an Aſs, though a naſty medicine, is an excellent remedy in this affect. But if the inveterate and contumacious evil do not yield to theſe remedies, then you muſt have recourſe to Copperas, Verdigreece, *ſal ammoniacum*, and Alum with Vinegar. It divers times happens, that the Ulcer ſpreading on, comes to take hold of the *Oſſa ethmoidæa*, or five-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 noſtrils, of *Aqua vitæ*, wherein Cephalick powders have been ſteeped for the greater drying.

Lib. 6. cap. 8. Gal. lib. 3. de Comp. med. ſecund. locos c. 3.

The cure.

Lib. 20. epiſt. 5.

An injection when the *Ozæna* ſhall come to the *Oſſa Ethmoidea.*

CHAP. XV.

Of the Ulcers of the Mouth.

OF this Tribe are the *Aphthæ*, Ulcers familiar to little children, according to *Hippocrates*. They oft-times begin in 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 evil humor (that is, venenate and malign) into the 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 amiſs to temper the nurſes milk with refrigerating meats, bathing

Apho. 24. ſect. 3. Celſus lib. 6. cap. 8. Gal. com. ad 3. lib. epidem.

The cure.

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 medicines, 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 metals, and which beſides is tempered with ſix parts of common water. You may for the ſame purpoſe uſe the Oyls of Vitriol, Sulphur, Antimony, Mercury-water, and the like. *Actius* wiſhes you to touch and correct ſuch Ulcers with a lock of Wooll dipped in ſcalding Oyl, and ſo faſtned to the end of a Probe, until 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 it ſelf alone will ſerve to cure Aphtha's, which are not malign. ℞ *Hordei integri p.* i. *plantag. ceterach. pilofellæ, agrimoniæ, an. M.* i. *fiat decoctio ad* lb i. *In qua diſſolve mellis roſati* ℥ i. *Diamoron.* ʒ ß. *Fiat gargariſma.* You may alſo make other gargles, of Pomegranate-Pills, Balauſtines, Sumach, Berberies, Red-roſes being boiled, and diſſolved in the ſtrained liquor *Diamoron* and *Diamuſcum*, with a little Alum: For *Galen* writes, that ſimple Ulcers of the mouth are healed with things which dry with moderation; now *Diamoron* and *Diamuſcum* are ſuch. But others ſtand in need of ſtrong medicines, 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 lies under which is rare and humid) 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 Ulces 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 *Scrophula*, or Kings-evil, and conſequently of an uncurable diſeaſe. In ſuch a caſe *Actius* and *Celſus* counſel is, to take out the rotten tooth, for ſo the Fiſtula will be taken away, the gum preſſing and thruſting it 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 eaſie. 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.

A Gargariſm for the *Aphthæ*.

Lib. 6. Meth. cap. 10.

Ulcers of the palat muſt be quickly and carefully dreſſed.

Actius lib. 6. cap. 3.

Celſus lib. 6. cap. 13.

CHAP. XVI.

Of the Ulcers of the Ears.

Their cauſes.

ULcers are bred in the auditory paſſage both by an external cauſe, as a ſtroke, or fall; as alſo by an internal, 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 diſburthen its ſelf.

The cure.

For the cure, the chief regard muſt be had of the antecedent cauſe, which feeds the Ulcer, and it muſt be diverted by purging medicines, Maſticatories and Errhines. This is the form of a Maſticatory. ℞ *Maſtich.* ʒ i. *ſtaphiſagr. & pyreth. an.* ℈ i. *Cinam. & caryoph. an.* ʒ ß. *Fiant Maſticatoria, utatur mane & veſpere.* But this is the form of an Errhin. ℞ *Succi betonic. mercurial. & meliſſæ, an.* ʒ ß. *Vini albi* ʒ i. *miſce & frequenter naribus attrahatur.* For topick medicines, we muſt ſhun all fatty and oily things, as *Galen* ſets 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.* ʒ ij. *Alumin.* ʒ i. *Atrament. ſutor.* ʒ ij. *Myrrhæ* ʒ i. *Thur. Ariſtoloch. gallarum. an.* ʒ ij. *Salis Ammon.* ʒ i. *Excipiantur omnia melicrato, & fiant trochiſci.* *Galen* in the ſame place witneſſeth, that he hath healed inveterate Ulcers, and of two years old of this kind, with the ſcales of Iron made into powder, and then boiled in ſharp Vinegar until it acquired the conſiſtence of Honey: Moreover, an Oxes gall diſſolved in ſtrong Vinigar, and dropped in warm, amends and dries up the putrefaction wherewith theſe Ulcers flow. Alſo the ſcales of Iron made into powder, boiled in ſharp Vinegar, dried 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 paſs forth, then muſt it be drawn out with an Inſtrument thereupon called a *Pyoulcus*, or Matter-drawer, whereof this is the figure.

A Maſticatory.

An Errhin.

The compoſition of *Andronius* his trochiſces.

Scales of Iron.

The Figure of a Pyoulcus, *or Matter-drawer.*

Of the *Pyoulcus Galen* makes mention 2. *ad Glauconem.*

CHAP.

CHAP. XVII.

Of the Ulcers of the Wind-pipe, Weazon, Stomach and Guts.

These parts are ulcerated either by an external cause as an acrid medicine, or poyson swallowed down; or by an internal cause, as a malign fretting humor, which may equal the force of poyson generated in the body, and restrained in these parts. If the pain be increased by swallowing or breathing, it is the sign of an Ulcer in the weazon, or wind-pipe joyning thereto. But the pain is most sentibly felt whenas that which is swallowed is either sour or acrid, or the air breathed in, is more hot or cold than ordinary: But if the cause of pain lie fastned in the stomach, more grievous symptoms urge; for sometimes they swound, have a nauseous disposition and vomiting, convulsions, gnawings, and pain almost intolerable, and the coldness of the extreme parts; all which when present at once, few scape unless such as are young, and have very strong bodies. The same affect may befal 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 Physicians 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* flaying, and as it were gathered together in that place, there is, as it were, a certain continual *Tenesmus*, or desire to go to stool. Now all such Ulcers are cured by meats and drinks, rather than by medicines, 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*, Litharge, Ceruse, Verdigreece and 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 toughness, 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 common ways of breath and meat; therefore they presently slip down and flow away; wherefore all such things shall be used in form of an *Eclegma*, to be taken lying on the back, and swallowed down by little and little, opening the muscles of the throat, lest the medicine passing down suddenly, and in great quantity, cause a Cough, a thing exceeding hurtful to these kinds of Ulcers. When they must be cleansed, you shall have crude honey, which hath a singular faculty above all other detergent things, in these kinds 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, inflamation and vomit, and besides, hinder the digestion of the meat: Therefore let them frequently use a Ptisan, and sugred Gellies wherein Gum Tragacanth, and Bole-Armeniack have been put, the decoction of Prunes, Dates, Figs, Raisins, Honey, Cows-milk boiled with the yolks of Eggs, 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 ungateful taste, such as are *Hypocistis*, Pomegranate-flowers and pills, *terra sigillata*, *sumach*, *acacia*, a decoction of Quinces, the Lentisk-wood, the tops of Vines, of Brambles, Myrtles, made in astringent Wine, unless there be fear of inflammation: Their drink shall be *Hydromel* water with sugar, syrup of Violets and Jujubes. Honey mixed with other medicines is a very fitting remedy for Ulcers of the guts and other parts more remote from the stomach; for if you shall use astringent medicines 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 cleanses the Ulcers themselves. Here also Asses milk may with good success be used instead of Goats or Cows milk; The use of a vulnerary potion is also commendable, if so be that it be made of such Herbs 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 Barley-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 unless with the loss of their faculty, so far as the great guts.

The causes.

Signs.

Gal. lib. 4. de loc. affect. cap. 5.

Lib. 4. & 5. Method. The cure.

How to take medicines for Ulcers of the throat.

Why acrid things must be shunned in these Ulcers.

How powerful Honey is to cure such kind of Ulcers.

Ægyptiacum good for the Ulcers of the greater guts.

Lib. 5. meth.

CHAP. XVIII.

Of the Ulcers of the Kidneys and Bladder.

Ulcers are caused in the Kidneys and Bladder, either by the use of acrid meats drinks, or medicines, as *Cantharides*; or else by thecollection of an acrid humor, bred in that place, sent or faln thither; or else by the rupture of some vessel, or an abscess broken and degenerated into an Ulcer, as it sometimes comes to pass. They are discerned by their site, for the pain and heaviness of Ulcers of the reins comes to the loins, and the *Pus* or matter is evacuated well and throughly mixed with the urine.

Caused.

Signs.

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 bloodless, fleshless and membranous part, hath not such power to resist putrefaction. That *Pus* which flows from the kidneys, never

flows without water; and although by long keeping in an urinal, it at length ſubſides or falls to the bottom, and may be ſeen ſeparated; yet when it is firſt made, you may ſee it perfectly mixed with the Urine; but that *Pus* which flows from the bladder is oft-times made alone without urine; and uſually it comes to paſs that the *Pus*, or matter which flows from the ulcerated kidneys, hath in it certain caruncles, or as it were hairs 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.

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 conflux 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 may fall down upon the kidneys or bladder. The enſuing potion is very effectual to mundifie thoſe kind of ulcers. ℞ *Hordei integri, M.* ij. *Glycyrrhizæ raſ. & contuſ.* ʒ ß. *Rad. acetoſæ & petroſel. a n.* ʒ vi. *Fiat decoctio ad* lb i. *in colatura diſſolve mellis diſpum.* ʒ ij. Let him take every morning the quantity of four ounces. *Gordonius* exceedingly commends the following Trochiſces. ℞ *Quatuor ſem. frig. maj. mundatorum, ſem. papaveris albi, ſem. malvæ, portul. cydon. baccarum myrti, tragacanth. gum. arab. nucum pinearum mund. piſtach. glycyrrhizæ mund. mucilaginis ſem. pſilii, amygd. dulc. hordei mund. an.* ʒ ij. *Bol. armeni. ſang. drac. ſpodii, roſarum, myrrhæ, an.* ʒ ß. *Exciſi cutis hydromelite, & fiant trochiſci ſinguli ponderis* ʒ ij. Let him take one thereof in the morning diſſolved in Barley-water or Goats-milk. *Galen* bids to mix 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 bottom thereof, or at the neck and urinary paſſage. If they be in the bottom, the pain is almoſt continual; 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 bottom ſends forth certain ſcaly or skinny excrements together with the urine; but that which is in the neck, cauſes almoſt a continual *Tenſmus*. Thoſe which are in the bottom 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 always remain in the bottom 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, falls and is complicated in its ſelf. Ulcers of the bladder are healed with the ſame medicines as thoſe of the reins are; but theſe not only taken by 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 ſharp pain than thoſe of the kidneys, therefore the Chirurgeon muſt be more diligent in uſing Anodynes. For this purpoſe, I have often by experience found, that the Oyl of Henbane made by expreſſion, gives certain help. He ſhall do the ſame with Cataplaſms and Liniments applied to the parts about the *Pecten* and all the lower belly with *Perinæum*, as alſo by caſting in of Clyſters. If that they ſtink, it will not be amiſs 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.

Why we muſt ſhun ſtrong purges.

Things to cleanſe theſe Ulcers.

Trochiſces for the ulcers of the kidneys and bladder. 4 *Method.*

Signs to know what part of the bladder is ulcerated.

Why Ulces in the bottom of the bladder are uncurable.

Ægyptiacum for the ulcers of the bladder.

CHAP. XIX.

Of the Ulcers of the Womb.

The cauſes.

ULcers are bred in the womb, either by the conflux of an acrid, or biting humor, fretting the coats thereof, or by a tumor againſt nature degenerating into an abſceſs, 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 joyned with much pain. 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 bottom, 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 Oyl of Vitriol and Antimony, and other things made ſomewhat more mild, 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 applied 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 medicines are exceeding fit for 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 down its excrements. If an ulcer take hold of the bottom of the womb, it ſhall be cleanſed, and the part alſo ſtrengthened, by making this following Injection. ℞ *Hordei integri p.* ij. *Guajaci* ʒ i. *Rad. Ireos.* ʒ ß. *Abſinth. plant. centaur. utriuſque, an. M* i. *Fiat decoct. in aqua fabrorum ad* lb ij. *in quibus diſſolve mellis roſati, & ſyrupi de abſinthio, an.* ʒ iij. *Fiat injectio.* For amending the ſtinking ſmell, I have often had certain experience of this enſuing remedy. ℞ *vini rub.* lb i. *Unguent. ægyptiaci* ʒ ij. *Boliarm. parum.* Thus the putrefaction may be corrected, and the painful maliciouſneſs of the humor abated. Ulcers when they are cleanſed, muſt preſently be cicatrized; that may be done with Alum-water, the water of Plantain wherein

Lib. 3. ſect. 12. tract. 2. cap. 5. Signs.

The cure.

Why ſtrongly drying things are good for Ulcers of the womb.

An Injection for an ulcer in the bottom of the womb.

An Injection hindring putrefaction.

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 for a proper Cancer, which you may find set down in the proper Treatise of Cancers. The cure of ulcers of the fundament was to be joyned to the cure of these of the womb; but I have thought good to refer 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*.

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 strait or crooked, and as it were infolded into certain windings within its self. Many parts are subject to *Varices*; as, the temples, the region of the belly under the navil, the testicles, womb, fundament, but principally the thighs and legs. The matter of them is usually melancholy blood, for *Varices* often grow in men of a melancholy temper, and which usually feed on gross meats, or such as breed gross and melancholy humors. Also women with child are commonly troubled with them, by reason of the heaping together of their suppressed menstrual evacuation. The precedent causes are a vehement concussion of the body, leaping, running, a painful journey on foot, a fall, the carrying of a heavy burthen, torture or racking. This kind of disease gives manifest signs thereof by the largeness, thickness, swelling and colour of the veins. 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 melancholy blood 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 dried blood, and cause pain, which is increased by going and compression. Such like *Varices* are to be opened by dividing the vein with a Lancet, and then the blood 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 days, and have applied convenient medicines. A *Varix* is often cut in the inside of the leg a little below the knee, in which place commonly the original thereof is seen. He which goes about to intercept a *Varix* downwards from the first original, and as it were fountain thereof, makes the cure far more difficult. For hence it is divided, as it were, into many rivulets, all which the Chirurgeon is forced to follow.

What a *Varix* is, and what be the differences thereof.

The matter.

The causes.

Signs.

The cure.

The cutting of *Varices*.

A *Varix* is therefore cut or taken away so, to intercept the passage of the blood and humours mixed together therewith, flowing to an ulcer seated beneath; or else left 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 ink; then taking the skin up between your fingers, cut it long-ways according as you have marked it; then free the bared vein from the adjacent bodies, and put thereunder a blunt-pointed needle (left 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 streight 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 until such time as they fall away of themselves. The operation being performed, let an astringent medicine be applied to the wound and the neighbouring parts; neither must you stir the wound any more for the space of three days. Then do all other things as are fit to be done to other such affects.

For what intention a *Varix* must be cut. *Paulus cap.* 82. *lib.* 6.

The manner how to cut it.

CHAP. XXI.

Of Fistula's.

A Fistula is a sinuous, white, narrow, callous, and not seldom 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 follows upon abscesses or ulcers not well cured.

What a Fistula is.

A *Callous* is a certain fleshy substance, white, solid, or dense and hard, dry and without pain, generated by heaping up of dried excrementitious phlegm, or else adust melancholy encompassing the circuit of the ulcer, and substituting it self in the place of the laudable flesh. The *Sinus* or cavity of a Fistula is sometimes dry, and other while drops with continual moisture: Sometimes the dropping of the matter suddenly 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 strait in, others, and that the greater part, have turnings and windings; some have one, others have more orifies and windings; some are at the joynts, 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,

What a *Callous* is.

The differences of Fistula's.

The signs.

sistance, 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 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 shews 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 pain, especially when you come to search with a Probe, especially if the matter which flows down be more acrid: Oft-times if it be cold, the member is stupified, the motion being weakened; besides also the matter which flows from thence is more subtle, and somewhat like unto that which flows 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 membranes which involve the muscles. If the Fistula be within the flesh, the matter flowing thence is more thick and plentiful, smooth, white and equal. If it descend into the veins or arteries, the same happens 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 suddenly shut up, cause death, especially in an ancient and weak body.

The sign that the bone is bare from the condition of the matter which is cast forth.

Actius tetr. 4. serm. 2. cap. 55.

Old Fistula's if closed prove mortal.

CHAP. XXII.

Of the cure of Fistula's.

How to find out the windings and cavities 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 in 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 Razor, or else apply actual or potential cauteries; for nature cannot, unless the callous substance be first taken away, restore or generate flesh, or agglutinate the distant bodies; For hard things cannot grow together, unless 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 dis-joynted 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 work 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 escarotick medicines, 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 near great vessels, nerves or principal intrails, must not be meddled 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 joynts 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 incurable; 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 bowels, which come into the parts orespread with large vessels or nerves, which happen to effeminate and tender persons, who had rather die by much, than 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 artificial 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 waste the faulty flesh, which grows up more than is fitting in the Ulcer, and to cleanse the *sordes* or filth, with medicines which may do it without biting or acrimony and putrefaction.

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.

CHAP. XXIII.

Of the Fiſtula's in the Fundament.

FIſtula's in the Fundament are bred of the ſame cauſes as other kinds of Fiſtula's are; to wit, of a wound or abſceſs 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 fundament, and the pain of the adjacent parts. But ſuch as are manifeſt, by the help of your probe you may find whither they go, 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 flows not only by the fundament, but alſo by the orifice which the malign humour hath opened by its acrimony, much matter, ſome whiles 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 flows there-hence than 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 term a Hens-arſe. Many ſymptoms 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 manual operation, let the Patient lye ſo upon his back, that lifting up his legs, his thighs may preſs his belly; then let the Chirurgeon, having his nail pared, put his finger, beſmeared 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. 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 a 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, and 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.

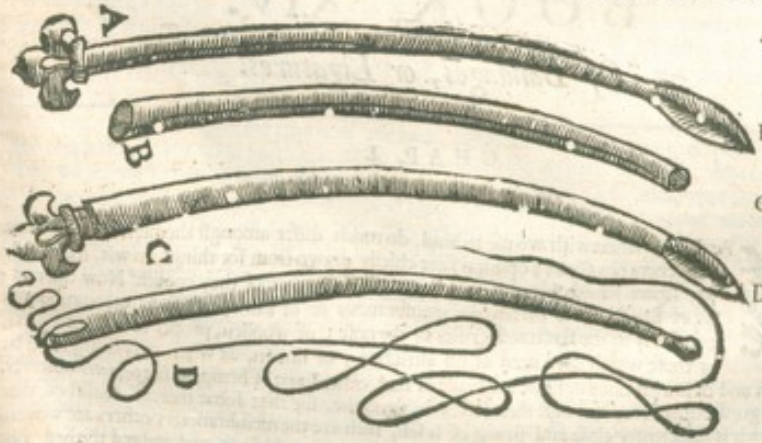
The cauſes.

Signs.

Symptoms.

The art of binding and cutting a Fiſtula of the fundament.

The Deſcription of a hollow ſilver Probe, to be uſed with a Needle, as alſo a leaden Probe.



A *Shews 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, only 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 parcel of the Callous body remain untouch'd by the medicine or Inſtrument, the Fiſtula reviving again, will cauſe a relapſe.

CHAP. XXIV.

Of Hæmorrhoides.

HÆmorrhoides as the word is uſually taken, are Tumors at the extremities of the veins encompaſſing the fundament, cauſed by the defluxion of an humor commonly melancholick, 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; others 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

What they are.

Their differences.

acrimony opens the mouths of the veins. But such as do not run, are either like blisters, such as happen in burns, and by Practicioners 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 *Uvales*, generated by the afflux of blood, laudable in quality, but over-abundant in quantity; or else they express the manner of a disease, whence they are termed *Morsles*, proceeding from the suppression of melancholick blood; or else they represent Warts, whence they are stiled *Verrucales*, enjoying the same material cause of the generation as the *Morsles* do. This affect is cause of many accidents in men; for the perpetual 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 month, sometimes only four times in a year. Great pain, inflammation, an abscess which may at length end in a Fistula, unless it be resisted by convenient remedies, do oft-times fore-run 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 eminent evils, 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 vessels thereof; and by flowing to the liver, cause a Dropsie by the suffocation of the native heat; they cause a Dropsie and universal leanness on the contrary, if they flow immoderately, by refrigerating the liver by loss 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 medicine. ℞ *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 medicine to the swoln places, and renew it every five hours. This kind of remedy is very prevalent for internal Hæmorrhoides; but such as are manifest, may be opened with Horse-leaches, or a Lancet. The juice or mass of the Herb called commonly Dead-nettle, or Arch-angel, applied to the swoln Hæmorrhoids, opens them, and makes the congealed blood flow there-hence. 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. ℞ *Olei ros.* ℥ iiij. *Cerussæ* ℥ i. *Litharg.* ℥ ß. *Cerænovæ,* ʒ vj. *Opii* ℈ i. *Fiat unguent. secundum artem.* Or else, ℞ *Thuris, myrrhæ, croci, an.* ʒ i. *Opii* ℈ i. *Fiat unguentum cum oleo rosarum & mucilagine sem. psillii, addendo vitellum unius ovi.* You may easily prosecute the residue of the cure according to the general rules of Art.

Symptomes.

Sect. 37. sect. 6. epid.

A remedy for the immoderate flowing of the Hæmorrhoides.

For suppress Hæmorrhoides.

The end of the Thirteenth Book.

BOOK XIV.

Of Bandages, or Ligatures.

CHAP. I.

Of the differences of Bandages.

Lib. de fasciis.

Bandages, wherewith we use to bind, do much differ amongst themselves: But their differences (in *Galen*'s 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 gristles 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, other some 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, and that they may straitly contain and repel 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 press into, and hurt the flesh that lies under them. Lace, whether in the midst or edges of the rowler, makes the Ligature unequal. For the member where it is touched with the lace, as that which will not yield, 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 of linnen clothes must be cut long-ways, and not athwart, for so they will keep more firm and strong that which they bind, and besides, they will be always alike, and not broader in one place than in another: But they thus differ in figure, for that some of them are rolled 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 truly consist of one piece, but that divided in the end (such are usually taken to bind up the breasts)

Sect. 3. de Chir. offic.

What doth best for rowlers.

of

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 term one part their body, another their heads. By the body we mean their due length and breadth; but their ends, whether they run long-ways or a-cross, we according to *Galen*, term them their heads.

Com. ad sect. 22. sect. 2. de offic. chir.

CHAP. II.

Sheweth the Indications and general Precepts of fitting 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 felt. From the part affected: So the leg, if you at any time bind it up, must be bound long-ways, for if you bind it over-thwart, 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 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 always 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 joyned together; otherwise the contained filth will eat into all that lies near it, increase the Ulcer, and make it uncurable, by rotting the bones which lie under it within 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 to their native unity, those parts which are disjoyned: Others are not used for their own sakes, but only to serve to hold fast such medicines as have a curative faculty. This kind of Ligature is either yet a doing, and is termed by *Hippocrates*, *Diligatio operans*; or else done and finished, and is called *Diligatio 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 stiff 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 special care, that there be no knot tied upon the same place, or upon the region of the back, buttocks, sides, joynt, or back-part of the head, or to conclude, in any other part upon which the Patient uses to lean, rest or lie. 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 skilful workman every where handsomely and rightly to perform that which may so be done.

We must always begin our ligatures at the bottom of a *sinus*.

Hip. text. 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 flows, 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 imposthumes, and other malign accidents. Now the blood which flows, goes but one way downwards, but that which is pressed, is carried as it were in two paths, to wit, from above downwards, 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 burthen, which threatens to fall upon it, without danger, and the increase of preternatural accidents. But when this mass and burthen 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.

CHAP. XXIV.

Of the three kinds of Bandages neceſſary in Fractures.

Sent. 24. ſect. 2. offic.

TWo ſorts of Ligatures are principally neceſſary for the Surgeon, according to *Hippocrates*, by which the bones as well broken as diſlocated may be held firm when they are reſtored to their natural place.

Hypodeſmides.

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 four 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 lie 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 go towards the oppoſite ſide in binding and rowling it. Here therefore would I require a Surgeon to be *Ambidexter*, (i. e.) 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; thep 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 natural and proper ſite thereof ſhould require. But to return to our former diſcourſe of the three Ligatures: The firſt Under-binder 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 there, for that, as we formerly ſaid, we muſt not force back, and preſs 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 preſs 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 rowl, whereas you left with the ſecond, and 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 inſtead of the three fore-mentioned Over-binders. Wherefore they carry this third Under-binder, wrapped from below upwards (as we formerly ſaid) contrary to the firſt and ſecond Under-binders; 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 Ligature, 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 mattes 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 ſymptom, 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 days, and then to foment the part with hot water, that ſo the humors, which (drawn thither by the vehemency of pain) have ſettled in the part, may be diſſolved and diſperſed; and itching and other ſuch like ſymptoms prevented. The fear of all accidents being paſt, let the ligation be ſooner or later looſed, and more ſlacked than 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.

Why *Hippo.* bids to looſe the Ligatures every third day.

CHAP.

CHAP. IV.

Of the binding up of Fractures associated with a Wound.

How to bind up a fracture 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 plentiful afflux of humors from the neighbouring 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 conveniency as you can, that it may be so large as to encompass 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-ways, let the boulsters and splints be applied 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 *Galen*'s opinion, they would dilate the wound, and the purulent matter would be pressed out, and cast back into the wound. *Ad sent. 12. sect. de fract.*

CHAP. V.

Certain common Precepts of the binding up of Fractures and Luxations.

IN every Fracture and Luxation, the depressed, hollow and extenuated parts, such as are near unto the joynts, ought to be filled up with boulsters, or clothes put about them, so to make the part equal, 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 near the wrist; and to conclude, in all other parts which have a conspicuous inequality by reason of some manifest cavity. *Hipp. sent. 37. & 38. sect. 1. de fract.*

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 sphacel 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 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 swollen, 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 symptoms, and the part must be fomented with warm *Hydreleum*, and another indifferent, yea verily, more loose ligature must be made instead 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 burthensome. When the Patient begins to recover, for three or four days 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 until 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 conclude, the seventh day being past, we must bind the part more straitly than before: For that 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.

The signs of too strait and loose binding up.

Why we must make more strait ligation on the broken part.

CHAP. VI.

The uses for which Ligatures serve.

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 joyn together those which gape; as in fractures, wounds, contusions, sinewous ulcers, and other like 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, unless they be hindred by due ligation. Bandages do also conduce to refresh emaciated parts:

The first benefit of ligatures

The second.

The third.

part: Wherefore if the right leg waste 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 painful; 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. The fourth. 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, The fifth. and making a ligature. Also ligatures, are useful 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 expultive 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 The sixth. otherwise would presently enter thereinto. This same ligature is a help to such are with child, for the more easie carrying of their burthen; especially those whose child lies so far downwards, 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 Navil-ligature; but also, her child be- The seventh. ing 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 medicines which are laid to a part, as the The eighth, the particular use of ligatures in the amputation of members. 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 less pain; and also to perform 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 animal spirits, and so deprive the part which lyes thereunder of the sense of feeling, by making it, as were, stupid or num.

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 equal 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 wrists, in the legs towards the feet, in the thighs towards the knees. Therefore you must fill these parts with boulsters and linnen clothes, that so they may be all 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 applied 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 applied athwart; but when in the latter, long-ways 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-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 applied.

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-board, of thin splinters of The matter of Splints. wood, of leather, such as shooe-soals are made with; of the rinds of trees, or plates of lattin, or lead, and such other like, which have a gentle and yielding stiffness; 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 strait or crooked according to the condition of the member whereto they must be applied. You must have a special care, that they run not so far as the swellings out, or eminencies of the bones; as the ankles, 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 Their use. 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 perform 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 press the part.

What Junks are. 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 The matter and use of Cases. plates of lattin, or else 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

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 left being not as yet well knit, or more loosly bound up for fear of Pain, Inflammation, or a Gangrene, they hang down, 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 general *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, whilst 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. *Glossocomium*, a general name for such things.

The End of the Fourteenth Book.

BOOK XV.

Of Fractures.

CHAP. I.

What a Fracture is, and what the differences thereof are.

A Fracture, in *Galen*'s 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 joynt; their unnatural growing together, their cutting or dividing asunder; contusion, abscess, putrefaction, rottenness, 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-ways, but together, and at once into two pieces overthwart, which Fracture is called *Raphanedon*, that is, after the manner of a Radish. *Lib. 6. method.* What it is for a bone to be broken *Raphanedon.*

A Fracture is made *Caryedon*, or like a nut, when as the bone flies into many small pieces, 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 Engines. Contrary to these are those fractures which are called *Schidacidon*, as rent into splinters, or after the manner of a board or piece of timber, that is, right-down, and alongst the bone: And these fractures either are apparent to the eye, or else not apparent, and therefore called Capillary, being so small, as that they cannot be perceived by the eye, unless you put ink upon them, and then shave them with your Scrapers. Sometimes the bone is only pressed down with the stroke; sometimes on the contrary it flies 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 bones are sometimes smooth and polished, otherwhiles unequal, and, as it 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-ways, 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 symptoms, as a Wound, Hæmorrhagy, Inflammation, Gangrene, and the like. Hereunto you may also add the differences drawn from the parts which the fractures possess; as from the head, ribs, limbs, joynts, and other members of the body. Add also these which are taken from the habit of bodies, aged, young, full of ill humours, well tempered; almost all which have their proper and peculiar indications for curing. Now the causes of fractures, are the too violent assaults or strokes of all external things, which may cut, bruise, break or shake: In this number of causes may also be reckoned, falls from high places, and infinite other things, which would be long and tedious to reckon up. What *Caryedon*, or *Alphitidon.* What *Schidacidon.* 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 be broken, we feel pieces of the bone severed asunder, and hear a certain crackling of these pieces under our hands, caused by the attrition of the shattered bones. Another sign is taken from the impotency of the part, which chiefly bewrays 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 it is there hollow, from whence the bone is flown or gone. but gibbous or bunching out whi- The first sign of a broken bone. Another. A third.

ther 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.

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 and symptoms may happen thereupon. He shall easily attain to the knowledge of all these things, who is not only well seen in the anatomical 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 stiff 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 drineſs 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 yielding 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 natural drineſs 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 concretes, 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 hardned 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 usual 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 flows 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 radical moisture, that is laudably holding and glutinous, and in the other there is store of waterish and excrementitious humours. 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 waterish 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 gross and viscous matter; whereby it comes to pass, that meats of grosser nutriment are to be used, and medicines applied which may help forwards the endeavour of Nature, as we shall declare hereafter. When the bones are broken near unto the joynts, 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 joynts 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 excess 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, 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 spongy, are sooner glued together by the interposition of a *Callus*, than those which are dense and solid. A *Callus* sooner grows in sanguin, than in cholerick bodies: But broken bones cannot be so happily agglutinated, nor restored in any body, but that always some asperity or unequal protuberancy may be seen on that part where the *Callus* is generated: Wherefore the Surgeon ought to make artificial 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 a danger of Convulsion by pricking a nerve, or the *Periosteum*. Sometimes the fragment 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 original. 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 of themselves. This extension must be performed in the first days, for afterwards there will happen inflammation: Which being present, it is dangerous to draw the nerves and tendons too

Why bones are more brittle in frosty weather.

Why the solution of continuity in bones is not so easily repaired. *Gal. in arte par.*

Why bones sooner knit in young bodies.

Meats of gross and tough nourishment conduce to the generation of a *Callus*.

Fractures at joynts dangerous.

Hip. sect. 18. & 19. *sect.* 1. *de fracturis.*

Ligations conduce to the handsomness of a *Callus*.

Extention must presently be made after the bone is broken.

too violently; for hence would enſue an Impoſthume, Convulſion, Gangrene and Mortification. Therefore *Hippocrates* forbids you to defer ſuch extenſion until 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 natural place, the part waſtes for want of nourihment; both for that the natural ſite of the veins, arteries and nerves, is perverted, as alſo becauſe the part it ſelf lies immovable, or ſcarce moveable: Whereby it cometh to paſs, 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 doubtful 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, until the humour which poſſeſſes the part be diſſolved, the tumor abated, and the bitterneſs of pain mitigated.

Sect. 36. ſect. 3. de fract.

In inflammations, the reſtoring of the bone muſt not be attempted.

CHAP. IV.

The general 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 ſymptoms and accidents; or elſe if they do happen, that then he temper and correct their preſent malignity: Such accidents are pain, inflammation, a feaver, abſceſs, gangrene and ſphacel. 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 skilful attendants be there, good ligatures, and alſo, if need ſo require, good engines. 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 near 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 ſtrait extenſion of the part affected: For when the bone is either broken or out of joynt, there is contraction of the muſcles towards their original, 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 preſs it down, if there be any thing that bunches or ſtands out. And laſtly, you ſhall bind it up, by applying boultiers and ſplints as ſhall be fit. But if the bone be diſlocated or forth of joynt, 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 engines 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 joynts; 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 Symptoms, Pain, Convulſion, a Palſie and Gangrene: All which ſooner happen to ſtrong and aged bodies, than to Children, Eunuchs, Women, Youths, and generally all moiſt bodies, 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 leſs 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 membrane remain ſmooth and equal; and laſtly, if the broken or diſlocated member compares with its oppoſite in the compoſure of the joynts, and knees, as the ankles 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 dreſs 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 members or joynts 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

Hipp. ſent. 60. ſect. 2. de fract.

Ad ſent. 1. ſect. 1. de fract.

Three things to be performed in curing broken and diſlocated bones.

How to put the bones in their places.

When inſtruments or engines are neceſſary.

What bodies are ſooner hurt by violent extenſion.

Signs of a bone well ſet.

Cauſes and ſigns of the relapſe of a ſet bone.

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 lies, 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 which 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 medicines, to wit, applying of Oyl of Roſes with the whites of Eggs, and the like repelling things, and then reſolving medicines, as the preſent neceſſity ſhall require. It will be convenient to moiſten your rowlers and boulſters in Oxycrate for this purpoſe, or elſe in Roſe-vinegar, if the Fracture be ſimple, or with Red-wine; or the liquor warm (in *Galen*'s opinion) if a wound be joyned to the Fracture; and it will be fit to moiſten Fractures often in Summer; for ſo the part is ſtrengthened, the defluxion being repelled, whereby the inflammation and pain are hindered. 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 dreſs the part, when it is needful, and with thoſe things which 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, (unleſs 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 days ſpace, unleſs peradventure pain urge you to the contrary. In diſlocations the ſame binding may be kept for ſeven or eight days, unleſs by chance ſome ſymptom 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 happning of evil accidents and ſymptoms, which, how he may bring to paſs, ſhall be declared in the following Chapter.

Ad. ſect. 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 binding and correction of accidents and ſymptoms.

Four 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 medicines, repelling the humour, and ſtrengthning 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, ariſing 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 *Galen*'s opinion) proceeds a painful 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 burthen of the emplaſters, boulſters and ligatures, which are put about the part. Hereunto may be added, that the part it ſelf doth not ſo perfectly perform and enjoy its wonted faculties and actions: By which it cometh to paſs, that the heat thereof is more languid than may ſuffice to diſcuſs the ſuliginous matter there collected. Wherefore it will be convenient to looſe the ligatures every third day, that as by looſing their ties, their ſanious and ſuliginous excrements, ſhut up under the skin, may freely paſs 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, Chamomil, Roſes, and Melilot made in Wine and water: For long fomenting attenuates and evacuates; but ſhorter fills 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 medicine; 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 then 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 that it cannot be reſtored into its ſeat, it muſt be cut off with your Cutting-mallets, or Parrats-beak, as occaſion ſhall offer it 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-burthened, neither too ſtrait bound, otherwiſe it will

The cauſes and differences of itching.

Ad ſect. 4. ſect. 2. de fract.

Remedies againſt the itching.

Hipp. ſect. 46. ſect. 3. de fract.

will be apt to inflammation. Thus much concerning fractures and diſlocations in general: Now we muſt deſcend to particulars, beginning with the fracture of the noſe.

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 ſpathem, or little ſtick handſomely faſhioned and wrapped about with cotten or a linnen rag, ſo to avoid pain: Therefore you ſhall hold the ſpathem 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 mad of ſponge, or flax, or a piece 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 lift them up higher: And then the noſe ſhall be in ſome ſort ſtayed with boulſters on each ſide, even until 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 preſs the noſe with too ſtrait binding, unleſs 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 medicine, which hath a faculty to repel and repreſs the deſtluxion, to ſtrengthen and keep the part in its due poſture, and to dry up and waſte the matter which hath already fallen down, ſhall be applied to the noſe, and all the other dry parts.

Hipp. ſent. 46. ſect. 2. de art.

How to reduce the noſe into its natural figure.

℞ *Thuris, maſtiches, bolì armeniæ, ſanguinis draconis, an.* ʒ ß. *Alumnis rochæ, reſinæ pini, an.* ʒ ij. *Pulveriſentur ſubtiliſſimè: Or* elſe, ℞ *Farinæ volatilis* ʒiß. *Albuminum ovorum quantum ſufficit, incorporentur ſimul, & fiat medicamentum.*

A fit aſtringent and drying medicine.

Neither ſhall you uſe any other art to cure the cartilaginous part of the noſe being fractured: Wherefore *Hippocrates* terms that ſolution of continuity that there happens, a fracture, as if it were in a bone; becauſe he could find no other name more fitly to expreſs 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, unleſs ſomething hinder, within the ſpace of twelve or fifteen days.

Sent. 47. ſect. 2. de art. & Gal. in Com.

CHAP. VII.

Of the Fracture of the lower Jaw.

THE lower jaw runs into two, as it were, horns or tops: The one whereof ends ſharp, and receives a tendon from the temporal muſcle; the other ends blunt and round under the mammillary proceſs, and it is there implanted in a ſmall cavity; it is joyned together in the middle of the chin by *Symphyſis*, and is marrowy 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 joyned 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 tied with a Gold or Silver wyer, or elſe an ordinary thred, to the next firm teeth, until ſuch time as they ſhall be faſtened, and the bones perfectly knit by a *Callus*: To which purpoſe, the ordered fragments of the fractured bone ſhall be ſtayed, by putting a ſplint on the outſide, made of ſuch leather as ſhooe-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 long-ways 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 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 faſtned 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 fall out, and cauſe a greater deſluxion. Unleſs inflammation, or ſome other grievous ſymptom ſhall happen, it is ſtrengthened with a *Callus* within twenty days; for that it is ſpongious, 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 medicine, deſcribed in the former Chapter, ſhall be uſed, as alſo others, as occaſion ſhall offer it ſelf.

A deſcription of the lower jaw.

The manner of reſtoring a broken jaw.

The deſcription of a fit ligature for the under-jaw.

In what time it may be healed.

The

The Patient muſt be fed with liquid meats, which ſtand not in need of chewing, until ſuch time as the *Callus* ſhall grow hard, leſt the ſcarce or ill-joynted fragments ſhould fly in ſunder with the labour of chewing. Therefore ſhall he be nouriſhed with Water-grewel, Ponado's, Cullaſſes, Barley-creams, Gellies, Broths, Rear-eggs, Reſtaurative Liquors, and other things of the like nature.

CHAP. VIII.

Of the Fracture of the Clavicle or Collar-bone.

Hipp. ſent. 63. ſect. 1. de art.

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, always the end faſtned to the ſhoulder and ſhoulder-blade, is lower than that which is joyned to the cheſt; for that the arm draws it downwards. The collar-bone, if broken athwart, is more eaſily reſtored and healed, than if it be cloven long-ways: 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 *ſchidacidon*, or into ſplinters, or long-ways, is more difficultly joyned and united to the ends and fragments; for thoſe pieces, which were ſet, will be plucked aſunder, even by the leaſt motion of the arms; 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 far 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 preſs 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 depreſt, that they cannot be drawn upwards by the fore-mentioned 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 bottom upwards, and covered with a rug or ſome ſuch thing: Then the ſervant ſhall ſo long preſs down the Patients ſhoulders with his hands, until 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 ſo broken into ſplinters that it cannot be reſtored, and any of the ſplinters prick and wound the fleſh, and ſo cauſe difficulty 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 medicine made of Wheat-flour, Frankincenſe, Bole-armeniack, *Sanguis draconis*, *Reſini pini*, made into powder, and mixed with the whites of Eggs, putting upon it ſplints covered with ſoft, worn linnen rags; covered over likewiſe with the ſame medicine, 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 repreſs 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 croſs-wiſe, of a hands breadth, and ſome two ells and half long, more or leſs, according to the Patients body. Now he ſhall be ſo rowled up, as it may draw his arm 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 Clowns 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 arm. A *Callus* oft-times grows on this bone, within the ſpace of twenty days 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.

An anatomical deſcription of the ſhoulder-blade.

THE Greeks call that *Omoplata*, which the Latins term *Scapula*, or *Scapula patella*, that is, the ſhoulder-blade. It is faſtned on the back to the ribs, nowl, 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 Anatomy: 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 proceſs, 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 proceſs 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

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 happning accidents are more grievous or gentle.

How many ways the ſhoulder-blade may be broken.

We know the ſpine or ridge of the ſhoulder-blade to be broken, when a dolorifick 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 pain moleſt the part, and if a numneſs trouble the arm, 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 prick 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 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 expel that which is dead far from it. The truth whereof was manifeſted in the Marqueſs of *Villars*, who at the Battel of *Dreux*, was wounded in his ſhoulder with a Piſtol-bullet, certain ſplinters of the broken bone were plucked forth with the pieces of his harneſs, 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 defluxion and inflammation ariſing in that place by reaſon of his labour in Arms, and the heavineſs of his Armour at the Battel 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 *Bourbon*, King of *Navarre*; *Francis* of *Lorrain*, Duke of *Guiſe*; the Count *Rhingrave Philipbert*, and many other in theſe late Civil 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 diffeminated into all the muſcles of the arm. Beſides, alſo inflammation and putrefaction ariſing there, are eaſily communicated by reaſon of their neighbourhood to the heart and other principal parts, whence grievous ſymptoms, and oft-times death it ſelf enſues.

The cure.

Lib. de vuln. capitis.

A Hiſtory.

Nature of its own accord makes it ſelf way to caſt forth ſtrange bodies and matters.

Why a fracture in the joynt 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 only thruſt in without a fracture. The inequality perceivable by your feeling, ſhews 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 blood, 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, whilſt 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 applied for to hinder inflammation, and aſſwage pain; boulſters ſhall be fitted thereto, and a ligature ſhall be made croſs-ways 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-piece, as alſo his *ſternum* together therewith, and he fell down as dead with the blow; he did ſpit blood 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 depreſt.

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, unleſs 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,

In what place the ſhort ribs may be broken.

Sent. 56. ſect. 3. de art. membrane, and laſtly, without any other ſymptom, then the danger is leſs: Therefore *Hippocrates* wiſheth, that thoſe, who are thus affected, fill themſelves 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 under-propped by the meat. Now that fracture which is outwardly, is far more eaſie to heal, than that which is inwardly; for that this pricketh the membrane or *Pleura*, and cauſeth inflammation, which may eaſily end in an *Empyema*. Add hereunto, that this is not ſo eaſily to be handled or dealt withal, as the other; whereby it cometh to paſs, that it cannot be ſo eaſily reſtored, for that theſe things cannot be ſo fully and freely performed in this kind of fracture, which are neceſſary to the ſetting of the bone, as to draw it out, hold it and joyn it together. It is therefore healed within twenty days, 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 than in a pleuriſie, troubles the Patient; becauſe the ſharp ſplinters prick the Coſtal membrane: Whence great difficulty in breathing, a cough, and ſpitting of blood enſue. For blood, 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 carried into the weazon, and at length ſpit out of the mouth. Some, to pull up the bone that is quite broken and depreſt, apply a Cupping-glaſs, 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 emplaſter made of Turpentine, Roſin, Black-pitch, Wheat-flour, Maſtich 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, until ſuch time as the Patient ſhall find himſelf better, and to breathe more eaſily. There will be much more hope of reſtitution, if, whilſt the Surgeon do this diligently, the Patient forbear coughing, and hold his breath: Otherwiſe, if neceſſity urge, as if ſharp ſplinters with moſt bitter tormenting pain prick the Coſtal membrane, overſpread with many nerves, veins and arteries, which run under the ribs, whence difficulty of breathing, ſpitting of blood, a cough and feaver 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 needful in a ſimple fracture, for that there are no ſymptoms which may require ſuch remedies; yet, they, by reaſon of the complicated ſymptoms, as a convulſion, feaver, *Empyema*, and the like, muſt here be preſcribed by the advice of the Phyſician which overſees the cure. A Cerate, and other remedies fitting the occaſion, ſhall be applied to the grieved part: No other ligatures can be uſed, than ſuch as are fit to hold faſt and ſtay the local medicines. There is no other rule of ſite and lying, than ſuch as is taken from the will and content of the Patient.

Why an internal fracture of the ribs is deadly.

The ſigns.

The cauſe of ſpitting blood when the ribs are broken.

Sent. 14. 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 preternatural affects which enſue upon broken Ribs.

MAny ſymptoms 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 inflamation, 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 merely puffed up of it ſelf, but alſo within 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 ſtroke 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 blind violence of nature, ſtirred thereto by a deſire of its own preſervation. Wherefore this half crude humour remaining there, raiſeth much flatuling from its ſelf, 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 quill: Therefore laying your hand thereon, you may hear the noiſe of the wind 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 abſceſs, 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 natural 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 medicines,

The cauſe.

The ſigns.

The cure.

medicines, 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 lies 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.

CHAP. XIII.

Of the Fracture of the Vertebræ, *or Rack-bones of the Back, and of their Processes.*

The affect of the *Vertebræ.*

THe *Vertebræ* are somewhiles broken, otherwhiles bruised or strained on the inside, whereby it cometh to pass, that the membranes which invest the spinal marrow, as also the spinal 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 symptoms, are the stupidity, or numness and palsie of the arms, legs, fundament and bladder, which diminith, or else take away from them the faculty of sense and motion: so that their urine and excrements come from them against their wills and knowledge, or else are wholly suppress. Which when they happen (saith *Hippocrates*) you may foretel that death is at hand, by reason that the spinal 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 spinal marrow, and the nerves thereof. If you cannot do this, at least you shall apply such medicines 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 wound 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, 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 strait on 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 strait up, on the contrary, the stretched skin is relaxed, and consequently left molested by the sharp fragments. The fractured processes of the *Vertebræ* easily heal, unless they be associated with some other more grievous symptom 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 days.

Sect. 2. Prog.

The cure of fractured *Vertebræ.*

The cure of the processes.

Signs that only the processes are fractured.

CHAP. XIV.

Of the Fracture of the Holy-bone.

What fracture of the holy-bone curable, and what not.

ALso the Holy-bone in a certain part thereof, which may easily be 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 spinal marrow contained therein, then the Patient can scarce scape death, for the reasons shewed in the former Chapter.

CHAP. XV.

Of the Fracture of the Rump.

The descripion of the rump.

The cure.

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 joyned 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 fragments 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 applied as occasion shall offer it self.

CHAP.

CHAP. XVI.

Of the Fracture of the Hip, or Os Ilium.

The description of the hip.

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 joyned together, that they can by no means be separated; but in children they may be separated without much ado. This bone may be broken in any part thereof, either by a stroke, 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 acording as art and necessity shall perswade and require.

The signs.

The cure.

CHAP. XVI.

Of the Fracture of the Shoulder or Arm-bone.

The description of the arm, or shoulder-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 behind; between which there is (as it were) an half-circle, or the cavity of a pully, 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 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 equal 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 there 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 toward 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 joynts. 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, until such time as the fragments shall be confirmed with a *Callus*, which usually is in forty days, 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. frac. 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 at 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, than any either ligatures or splints, for that it keeps the muscles right in their places: Wherefore,

The cure.

Wherefore after the bones shall be set and rowled up with ligatures and splints, the arm must be so carried up in a scarf put about the neck, that the hand may not be much higher than the elbow, lest the bloud 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 lie 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 equal 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 tied up part, and the intermission of its proper function, the bones of the joint may be soldered together by the interposition, and as it were glue of the defluxion which falls abundantly into the joint of the elbow, and neighbouring parts, whence the stiffness and unmovableness 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 calls 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 Lattin, or Past-board, 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 shews you.

Sect. 3. fil. 1. *de Fract.*

Com. in lib. de Art.

The Figure of a fractured Arm, with a wound bound up, and seated, as is fit.

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 Work-master 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 tied 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 spongy 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 onely 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 strait 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.

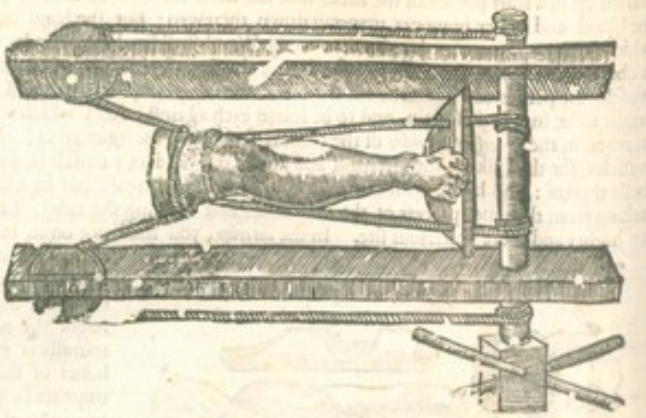
IT is a hard thing to bring the fragments of the broken Thigh together to be set, by reason of the large and strong Muscles of that part; which whilest they are drawn back towards their original, by a motion both natural and convulsive, they carry together with them the fragment of the bone, whereinto they are inserted: Therefore, when as the Fracture of this bone shall be restored, the Patient must lie 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.

Sect. 67, & 68. Sect. 2. de Fract.

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 much, 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 a 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 unmovable: 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 out-ſide, therefore it muſt be ſet in its native figure: Otherwiſe, if any, unmindful of this conſideration, would have it ſtraight, 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 compreſs 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 applied 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, until they be ſtrengthened by a *Callus*: The ſecond is, to hinder defluxion, which eaſily falls 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 applied. Inflammation is hindered by repreſſing and hindering the bloud and other humours, ready to flow down, from entering into the part, and by preſſing thoſe humours which are preternaturally contained in the part, into the neighbouring parts above and 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 coarſe or rough; and let them be of ſuch length and bredth as the Surgeon, perſuaded by an artificial 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 bredth to involve and cover all the fractured part, and a great part of that which is ſound: But ſeeing that in my Book of Bandages, I have ſeemed chiefly to ſet down and approve the manner of binding uſed by *Hippocrates*, now I think 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 onely ſtrained, making the firſt wrappings upon it; ſo that they moſt and ſtraitlieſt bind it there, but leſs 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 lie one upon another, they will hold the bones more firmly, and more far and wide preſs forth and repreſs the ſuperfluous bloud 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 preſs the humours the leſs to the extremities of the part, as thoſe which cannot receive and bear, without inflammation and danger of a Gangrene, ſuch abundance of humours, for that they are not ſufficiently ſpacious; 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-board, or ſome ſuch matter; the firſt below the Fracture, and that truly more broad, and of ſufficient length; and then two others, one on each ſide, diſtant each from other ſome fingers bredth, to the end to keep the bone that it do not flir 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 lie ſoft; the ſecond, ſmooth and even; the third, ſomewhat high. The hurt part ought truly to lie 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, whileſt 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 lie ſmooth or even, becauſe an unequal or uneven

The Figure of a Gloſſocomium, *or Extender.*



The natural and internal crookedneſs muſt be preſerved in ſetting the bone.

The part to be bound up, muſt be made plain either by Nature or Art.

The manner of binding uſed by Surgeons at this day.

Why the winding 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 mindful of three things in placing the member.

uneven site distorts or draws awry the part, whilest one portion of the hurt part is born up, and sustained by that which lies 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 defluxion of humours is to be feared. But the part ought to lie somewhat high, that the defluxion may be hindered, which is easily stirred up by a prone and declining site: for if the foot shall be placed in a lower figure, the bloud which flows thither from the leg, will cause inflammation. But on the contrary, if it be higher, nothing can flow down thereinto: Therefore absolutely not onely 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 equal length with the sound, and for that purpose it must be staid 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 at first wrapped; yea, verily the Knee is lifted up into a soft tumor by the expression of the humour from the wounded part: but on the contrary, the ensuing day the ligation is slackned and relaxed, some portion of the humour contained in the part being digested. Also the next day all things are perceived more loose, there being made a larger resolution of the humour: Then therefore the bandages must be loosed, and that not onely, 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 humours, wherewith the part is moistned, and the alimentary humours, in a part which is idle and at quiet; by reason the diffliation and transpiration are hindered 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 onely an itching, but also the skin being broke by the acrimony of these, as well vapours as humours, 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 bloud and spirits, the native and internal heat being by this means revived. If, together with the tumour there be a contusion and fugillation, it must be the longer fomented, that the excrementitious humour 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 discuss; but a longer and stronger wastes the flesh. Besides also you must have regard to the temper and habit of the Patient; for fomentations used to plethorick bodies, draw superfluous humours to the part. The Ancients bid, that the ligatures be loosed every third day until their seventh day; 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 seldom; renewing the ligatures, and the rest of the dressing. Therefore, if no symptom urge, I would have none of these things which are done to the Patient at the first dressing, to be moved, unless as slowly and seldom as you may: For you hinder the knitting of the bone, if you never so little move the ends of the fragments thereof: for, as you see Wood is joined together by Glue, and Pewter with Solder; so the fragments of bones are, by a providence of Nature, glued and soldred 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 flows 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 catagmatick Platters, which shall hereafter be described in speaking of the Fracture of a Leg.

Sect. 2. de fract.

Sect. 33, & 56. fect. 2. de fract.

When the first ligation must be loosed.

Sect. 15. sect. 3. de offic.

Rest necessary for the knitting of fer 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, increased my persuasion 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 onely 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

A History.

Another Fracture of the Thigh, resembling a luxation.

appendix

appendix from the top of the thigh-bone, but have judged it onely 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 tied many knots thereon, for the better taking hold and lifting up her ſelf; the which thing you muſt always 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 Fever, watchings, and want of reſt. This opportunity of raiſing the body out of the Bed, is by ſo much the more needful 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 bloudleſs, and by reaſon of the multitudes of the Nerves, Tendons, and Ligaments, which are obnoxious to many malign ſymptoms: 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 onely 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 lie 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 careful that he move himſelf or his body as little as he can. Many of the Ancients have ſet down the time of the conſolidation of this bone to be fifty days: 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.

Why the Fracture of a bone near a joint is more dangerous.

Lib. 3. ſect. 6. tract. 1. c. 14.

In what ſpace the thigh-bone may be knit.

CHAP. XXII.

Of the Fracture of the Patella, *or Whirl-bone of the Knee.*

The Differences.

THe Whirl-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 ſomewhiles ſhivered into many ſplinters, and all theſe either with or without a wound.

Signs.

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.

Cure.

It is ſet after this manner; with the Patient to ſtretch forth his leg, yea, he muſt keep it extended all the while until it be knit; and therefore leſt he ſhould bend it unawares, the hollowneſs of the ham ſhall be filled with a bouſter; for by bending of the Knee the ſet fragments of the Whirl-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 knitting 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 painful. The Patient muſt neceſſarily for this kind of Fracture lie or keep his Bed, at the leaſt for forty days.

Why thoſe halt who have had this bone fractured.

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 bulk 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 ſelf. On the contrary, when the ſhin-bone only is broken, the ſigns thereof appear only in the external part of the leg; becauſe the leg-bone being oppoſed thereto, doth not ſuffer it to caſt in it 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 dreſs 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

Sign that both the bones are broken.

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 bredth above my ankle. 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 carried to the other ſide of the Water to be dreſſed; but the ſtirring of the Boat as they rowed, almoſt killed me with bitterneſs 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 bitterneſs 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 Medicin as the time and place would afford, we compoſed it of the White of Egg, Wheat-flour, Soot of a Chimney, 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 place; 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 preſs forth the bloud, and the clods of bloud 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 would have three rowlers in a readineſs, 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 ſtraight upon the wound; and that he would fill the cavity of the ham and of the ankles with boulſters made of flax wrapped in linnen cloths: 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 ſtraight 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 external 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 errour be here committed, it will cauſe no leſs then lameneſs: For if it be lifted up higher than is fit, the *Callus* will be hollow on the foreſide; if lower, then it will be gibbous or bunching forth. Neither alſo do they commit a ſmall errour, who do not fill up the cavities at the ancles after the afore-mentioned manner: for, hereupon the heel will be much afflicted, whileſt it is forced to ſuſtain a tedious and painful compreſſion, which at length brings a hot diſtemper, becauſe the ſpirits cannot freely flow thereto; which I finding by experience, not knowing the cauſe, wiſhed 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 the contained vapours paſſing forth. To conclude, my hurt leg was laid upon a cuſhion, after the manner you ſee here deſcribed.

A Hiſtory.

A ſoon made Medicin.

What to do when the Leg is broken.

The figure of a Leg fractured with a Wound, and bound up.

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 humours preſſed thither by the force of the ligation made on this and that ſide, above and below, whence enſue many malign ſymptoms. You may make trial 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 humours 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 flows 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

That the ligation muſt be moſt ſtrait upon the wound.

What ſymtoms enſue the want of binding upon the wounded part

Signs of the corruption of the bones.

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 sorrowful 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 Chirurgeon 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 symptoms 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 practice 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 return to the former History of my mishap, and declare what was done to me after that first dressing, which I have formerly mentioned.

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.

I Being brought home to mine own house in *Paris* in the afternoon, they took from me, out of the Basilica of the left arm, some six ounces of bloud: And then at the second dressing the lips or edges of the wound and places thereabout were anointed with *unguentum rosatum*, which by a joint consent of the Ancients, is much commended in the beginnings of fractures; for it will assuage pain, and hinder inflammation, by repelling the humours far from the wounded part: for it is cold, astringent and repelling, as the composition thereof shews; for it is made *ex oleo omphacino, aqua rosacea, parco aceto, & cera alba*. Therefore I used this ointment for six days; 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 humours; 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 Vinegar: for, by their too much dryness, 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 onely 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 external 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 days: In stead hereof you shall use the emplasters, which I shall presently describe. In the beginning of my disease I used to spare a diet, that for nine days I ate nothing each day but twelve stewed Prunes, and six morsels of bread, and drank a *Paris* pint of sugred Water, of which Water this was the composition. ℞ *Sacc. albiss.* ʒ xij. *aquæ font.* lb xij. *cinam.* ʒ iij. *bulliant 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. ℞ *Aquæ coctæ* lb vj. *sacc. albiss.* ʒ iv. *succ. lim.* ʒ j. *agitentur & transvasentur sæpius in vasis vitreis:* I was purged when need required with a bole of *Cassia* with Rubarb: I used also Suppositories of Castle-Soap to make me go to stool; for, if at any time I wanted due evacuation, a preternatural heat presently seized 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 humour suppresst in the bottom 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 material 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, and pressed the sides of the wound; neither could they be perfectly composed or set, unless

unguentum Rosatum, wherefore good in Fractures.

You must have a care that the compresses and rowlers grow not hard by drines.

The description of a sugred Water.

The causes of a Fever and Abscess, ensuing upon a Fracture.

Signs of scales severed from their bones.

unless by a new extension and impulsion, which was much more painful to me than the former. My Fever when it had lasted me seven days, at length enjoyed a *crisis* and end, partly by the eruption of matter, and partly by sweat, flowing from me in a plenteous manner.

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 it self while we sleep, into the center of the body; whereby it cometh to pass, that the extreme 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 evil 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 again displaced, and with great torment of pain, fall from their former seat. This contraction of the Muscles is towards their original.

Why the extreme parts are cold when we sleep.

CHAP. XXVII.

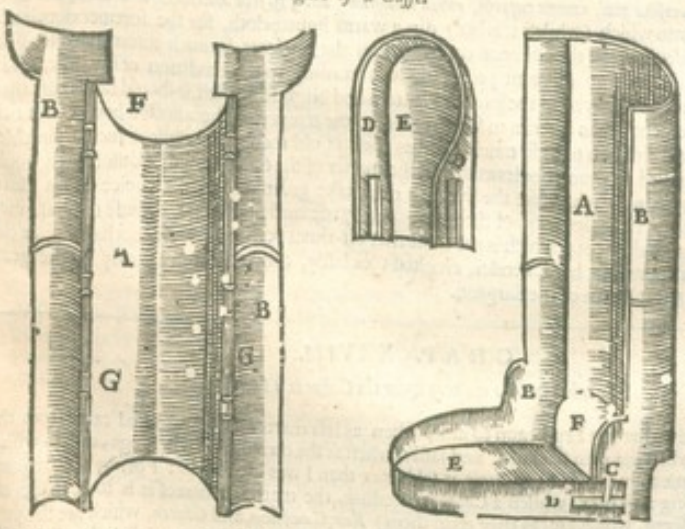
Certain documents concerning the parts whereon the Patient must necessarily rest whilest he lies in his Bed.

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 lie, 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 decayes, and grows dull by 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 difficultly healed, yea, and oft-times they cause a gangrene in the flesh, and a rottenness and mortification in the bones thereunder, and for the most part a continued Fever, *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 sixt 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 feverish, and that which is preternatural; as also by the infection of the noble parts, whose use the life cannot want, by carrion-like vapors. When as I considered all these things with my self, and (become more skilful by the example of others) understood how dangerous they were, I wished them now and then to lift my heel 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 continual 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 cloths spred over with *unguentum rosatum*, for the assuaging of the pain and heat: Besides also, I devised

The natural 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.



A A *Shews the bottom or belly of the Casse.* B B *The wings or sides to be opened and shut at pleasure.* C *The end of the wings, whereto the sole or arch is fitted.* D D *The Arch.* E E *The Sole.* F F *An open space whereat the heel hangs forth of the Casse.*

Remedies for the prevention of the aforesaid Ulcers.

The use of a Lattin Casse.

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 Casse 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 Casse is hollow: besides also, it arms and defends it against the falling down and weight of the bed-cloths, 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 applied 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 Eggs, common Oil, Turpentine, and a little Wheat-flour, and I used it till it was opened; then to cleanse it I used this following remedy. ℞ *Syrupi rosati & terebinth. veneta, an.* ℥ ij. *pulveris radicis iridis florentiæ, aloes, masticches, farinæ hordei, an.* ʒ 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 bottom 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 endeavour in cicatrization. For, the fragments of the bones, they by reason of their natural drinesse and hardnesse, 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 with you to make use of the following emplasters, of whose efficacy I have had experience; for, hence they are called knitting or consolidating plasters. ℞ *Olei myrtil. & rosarum omphac. an.* lb ß. *rad. althææ* lb ij. *rad. fraxini, & fol. ejusd. rad. consolidæ majoris & fol. ejusd. fol. salicis, an.* m. j. *fiat decoctio in sufficiente quant. vini nigri, & aquæ fabrorum, ad medietatis consumptionem, adde in colatura pulveris myrrhæ & thuris an.* ℥ ß. *adipis hirci,* lb ß. *terebinth. lotæ* ℥ iv. *masticches,* ʒ iij. *lithargyri auri & argenti, an.* ℥ ij. *boli armeniæ, & terræ sigillatæ an.* ℥ j. ß. *minii* ʒ vj. *ceræ albæ quantum sufficit: fiat emplastrum, ut artis est.* In stead hereof you may use the black emplaster, whereof this is the description. ℞ *Lithargyri auri* lb j. *olei & aceti* lb ij. *coquantur simul lento igne donec nigrum & splendens reddatur emplastrum, & non adhæreat digitis.* Or else, ℞ *Olei rosat. & myrtil. an.* ℥ ij. *nucum cupressi, boli armen. sanguinis drac. pulverisatorum an.* ʒ ß. *emplast. diacalcitheos* ℥ iv. *liquefaciant simul & fiat emplastrum secundum artem.* In defect of these, you may use a Cerecloth, or *Tela Gualteri*, whereof this is the description. ℞ *Pulveris thuris, farinæ volatilis, masticches, boli arm. resinæ pini, nucum 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 Nightshade, 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 applied 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 often-times remedies good of themselves, are by use made not good, because they are used and applied without judgment; 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 errour, and to the great shame of the Surgeon.

A suppurative Medicin.

A detersive.

Catagmatick Powders have power to cast forth the scales of bones

The causes both efficient and material of a *Callus*.

Medicins conducing to the generation of a *Callus*.

The black Plaster.

The description of a *Sparadrapum*, or Cerecloth.

Medicins good of themselves, not good by event.

CHAP. XXVIII.

By what means we may know the Callus is a breeding.

When the *Callus* is breeding the Ulcer must be seldom dressed.

THen I knew that my Leg begun to knit, when as less matter than was usual came from the Ulcer, when the pain slackned, 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 dewy bloud out of the edges and pores of the wounds, which gently died 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 thenceforwards I somewhat loosened the ligation, lest by keeping it too strait, I should hinder from entering to the fragments of the bones, the matter of the *Callus*, which is a portion of the bloud, temperate in quality, and moderate in quantity. Then therefore I thought good to use nourishments fit to generate more gross, thick, and tenacious bloud, and sufficient for generating a *Callus*; such as are the extremities, tendinous, and grisly 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,

Hipp. sent. 43. sect. 1. de fract.

Meats fit for generating a *Callus*.

mity, or Wheat sodden in Capon broth with the yolks of Eggs; 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 hurtful (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 those meats onely 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 parts thereof. There are also some of these veins which carry bloud 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 bloud, which flows 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 fore-mentioned use. By the same ways the Nerves also insinuate themselves, from whence proceeds a membrane which involves the marrow of the bones, the which by that means is indued with most exquisite sense, as experience teacheth; which is the cause that makes many believe that the marrow hath sense of feeling, because the membranes thereof being hurt cause mott bitter pain. Therefore out of the marrow and the proper substance of the bone, there sweats a certain gross and terrestrial juice, whereof by the power of the assimilating faculty, which serves in stead of the formative, a *Callus* grows and knits. Simple fractures of the leg are usually knit in fifty days, but through the occasion of the Wound, and the scales quite broke off, and other accidents which befel me, it was three whole Moneths before the fragments of the bones were perfectly knit, and it was also another Moneth before I could go upon my Leg without the help of a Crutch. Going was painful to me for some few days, because the *Callus* had taken up some place of the muscles: for before my former freedom 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 faithful assistance amongst the Surgeons, to omit Physicians, of *Anthony Portal* the Kings Surgeon.

Lib.6. Meth.4.

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 powerful 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 grows soft, and is relaxed. But on the contrary, those things which help forwards a *Callus*, must be drying, incrassating, thickning, 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 case the place must be fomented with a decoction of a Sheeps-head and guts, wherein shall be boiled the roots of Marsh-mallows, of Briony, the seeds of Line, Fænugreek, Pigeons-dung, Bay-berries, and the like. You shall also use this following Ointment and Plaster. ℞ *Unguenti de Althæa* ℥ iv. *olei liliorum, & axungiæ anserin, an.* ℥ j. *aquæ vitæ parum, liquefiant simul, fiat linimentum, quo linatur pars.* Then apply this following Emplaster. ℞ *Emplast. de Vigo cum Mercurio, cerati aspalati, descriptione Phylagrii, an.* ℥ iij. *olei anethini & liliorum, an.* ℥ j. *liquefiant omnia simul, fiat emplastrum*; let it be spread 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 natural 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 hazard 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 Bays, wherein Salt-petre, or some other kind of Salt hath been dissolved, then wrap it about with a rowler to bind it very straitly, putting a leaden plate thereon, whereby the flowing down of the nourishing humour into the part, may be forbidden, that thus by little and little the *Callus* may decay and diminish. If on the contrary it any ways happen that the *Callus* be more thin and slender, and grows more slowly, for that it is too straitly 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,

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*.

Remedies therefore

quantity, or both; or for that the ligature used to the part is too often loosed, or because the part it self is too hastily, and before the time put to undergo solid offices and motions. According to the variety of causes medicins shall be applied; 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 arm-pits, 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.

When we must desist from fomenting and frictions.

CHAP. XXX.

Of fomentations which be used to broken bones.

Warm Water. The effects thereof.

DIvers fomentations are used to broken bones for several 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 Physician and Patient. A fomentation of such water used for some short space, doth moderately heat, attenuate, and prepare for resolution, the humour which is in the surface of the body, it draws bloud and an alimentary humour to the part labouring of an *atrophia*; it assuages 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 humour 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 swollen: 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 humours; 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.

Notes of short, just, and too long fomenting.

Fomentations hurt plethorick bodies.

CHAP. XXXI.

Of the Fracture of the bones of the Feet.

Why the fractured bones of the foot must be kept in a strait posture.

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 until they be knit.

The End of the Fifteenth Book.

BOOK XVI.

Of DISLOCATIONS or LUXATIONS.

CHAP. I.

Of the Kinds and Manners of Dislocations.

What a Luxation properly so called is. What a Luxation not properly so called is.

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 kind 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 Focile flies from

The third kind of dislocation.

from the other: yet this may be referred to the second sort of Dislocations, because it happens not without dilatation, 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 drines and hardnes, thus the bones of children are bended or crooked in by reason of their natural softnes and humidity. The fourth.

CHAP. II.

Of the Differences of Dislocations.

SOme Dislocations are simple, others compound: We term them simple which have no other preternatural affect joined with them; and such compound, as are complicated with one or more preternatural 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 compleat and perfect, as when the bone wholly falls out of its cavity; other some are imperfect, as when it is onely lightly moved, and not wholly fallen out; wherefore we onely call them subluxations or strains. 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 onely according to some of them. Differences are also taken from the condition of the dislocated Joint in greatnes and littlenes, from the superficiary or deep excavation of the *sinus* or hollownes; 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 several Indications of curing, according to the variety of each of these, as we shall teach hereafter. What Luxations are simple. What compound. What a compleat Luxation is.

CHAP. III.

Of the Causes of Dislocations.

THere are three general causes of Luxations, internal, external, and hereditary: The internal, are excrementitious humours and flatulencies, which setling into the joints with great force and plenty, do so make slippery, soften and relax the ligaments which bind together the bones, that they easily fall out of their cavities, or else they so fill and 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 humour 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 external causes of Dislocations are falls from high, bruising and heavy blows, 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. Hereditary causes are such as the Parents transfuse into their off-spring: hence it is, that crooked not necessarily, but often-times 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 loosnes of the joints: whence also we see many crook-legged and footed from their nativity, so that none need marvel or make any doubt hereof. We have read it observed by *Galen*, *In Libro de Artic.* that children may have imposthumes in their Mothers Wombs, which may cast forth quitture, the Ulcers being opened of their own accord, and be cicatrized by the onely benefit of Nature. It also happens to many from their first conformation, that the cavities of their joints are less depressed 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 less enter into them. It falls out that othersome 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 original 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 slipperines they less 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 oft-times observed in some. What a subluxation or strain. Internal causes of dislocations. External causes. Hereditary causes. *Sect.* 3. *sect.* 88. & 94. *sect.* 82. 4. *sect.* 3, & 4. *lib. de art.* Children may have Impostumes in their Mothers Wombs.

CHAP. IV.

The signs of Dislocations.

SOme of the signs whereby we come to the knowledge of a luxated bone, are common to all dislocations; others are proper onely to several Luxations. It is a common sign that there is always a tumor in that part whereto the bone runs, and a hollownes on that side from whence it is flown. Now the proper signs shall be shewed, when as we come to treat of the particular The common sign of all dislocations.

ticular kinds 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 suspition 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 ways, neither by Nature or any accident, wronged, nor deformed, nor withered or decayed, nor swollen above measure, otherwise it may cozen and deceive you, if you be less wary. Labour and difficulty of action in moving, is a sign of an uncompleat 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 to the contrary part, and suddenly 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 imperfect dislocation.

CHAP. V.

Of Prognosticks to be made upon Luxations.

What luxations be uncurable.

ALl Joints may be perverted and 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 spinal marrow presently at the original 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 it be set. The bones of other Joints, as they are more or less dislocated and moved out of their seats, so may they be more easily or difficultly restored: For, by how much they are the less 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 laxated 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 contrary, such as are lean, especially those who formerly have been more fat, have their joints more lax, whereby it comes to pass, that their bones may easily be put forth of joint: besides also, through the default of the digestive faculty, they have their joints replete with mucous humours; whence it is, that the heads of the bones, as standing in a slippery place, are the less 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 asunder, as when the shoulder-blade flies 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 external cause, they, after they be set, may easily fall out again, for that the ligaments, moistned and bedewed with an excrementitious humour, cannot firmly hold them: oft-times the ligaments are not wholly broken, but onely 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 swollen up with an excrementitious humidity, are so much shortned 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 skilful hand soever they be handled, be again fitly placed and put together. Old and inveterate dislocations, wherein a tough humour 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 continual attrition made themselves a new cavity in the neighbouring bone: neither if they be restored, is the restitution firm and of continuance, because the natural 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 decays by an *atrophia*, because the part doth absolutely lose all motion: for by the opinion of *Hippocrates*, the performance of the proper action increases strength, and makes the part in better plight; but idleness debilitates and makes it lean. If a great wound and tracture 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 symptoms. Wherefore *Hippocrates* judges it better in such a concourse and complication of preternatural 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, onely lameness is to be feared. Every dislocation must be restored before inflammation come; but if it be already present, you must presently be careful to take it away: For other things, let the Patient rest, lest if the affect be irritated, the increase and access of pain cause a convulsion, gangrene, and lastly death, as I remember I have sometimes observed. Therefore when inflammation, and other malign symptoms shall be mitigated and

Why those bones which are hardly dislocated, are hard to be set.

Sect. 2. *de Art. sent.* 29. *Celsus lib.* 8. *cap.* 11.

Why 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 endeavour to set an inflamed joint.

and corrected, then may you endeavour 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 groſs and compact. And let thus much ſuffice for Prognoſticks in Luxations.

CHAP. VI.

Of the general cure of Diſlocations.

FOr all that I have heretofore delivered the general 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 ſymptoms. Five inventions in curing Diſlocations.

The firſt ſcope, which we ſaid was of holding, is meant either of the whole body, or elſe of ſome part thereof onely. 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 onely 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 Workmaſters labour and endeavour to reſtore it is to no purpoſe. 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 always performed by the hands, which when they cannot ſuffice, we muſt have the aſſiſtance of Inſtruments and Engines, whoſe figures you ſhall ſee hereafter delineated: But that you may not do amiſs, you may ſo far uſe extenſion, until 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 ſpecial 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 extreme into another, and the bone, for example 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 eaſily be done in freſh and late happening diſlocations. We underſtand that the bone is ſet by the noiſe, or as it were a pop, or ſound like that, which ſolid and ſounding bodies, being fully and forcibly thruſt into their cavities, do make; by the ſimilitude and conſent in figure, magnitude, and all conformation of the affected part with the ſound; and laſtly, by the mitigation of the pain. 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 carried 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 cloths, or compreſſes ſteeped in Roſe Vinegar, and ſpred with convenient Medicins; then let it be bound with an artificial deligation, rowling the ligatures unto the part contrary to that whereto the diſlocated bone flew. 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 days ſpace meddle with nothing about the diſlocation, unleſs pain, or ſome ſuch like ſymptom happen. For then the fifth ſcope will call us from that ceſſation and reſt, which is, to correct the ſymptoms and complicate affections, as pain, inflammation, a wound, fracture, and others, 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 aſſwaging and curing them; then of the reſtoring the Diſlocation.

The benefit of holding the member in Diſlocations.

The uſe of extenſion.

The manner of ſetting it, or putting it into its place.

Signs that the bone is ſet.

The benefit of fit placing the member.

The manner of binding up the ſet joint.

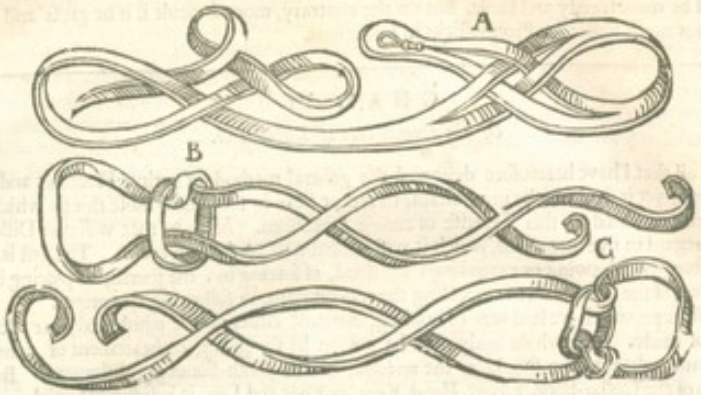
The cure of inveterate luxations.

CHAP. VII.

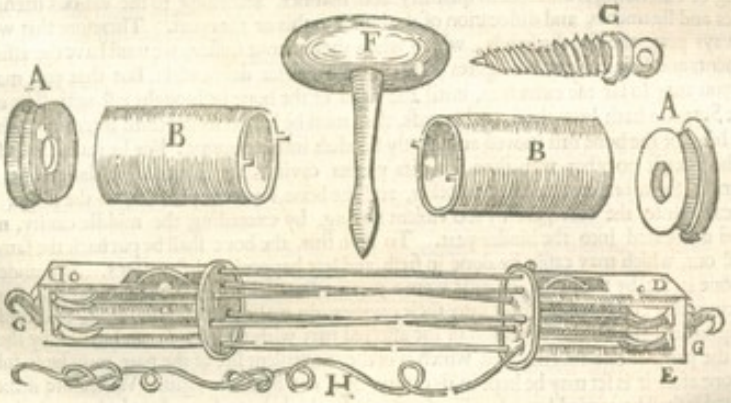
The deſcription of certain Engines ſerving for the reſtoring of Diſlocations.

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 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 ſtraightly. These figtures are not for deligation, but extenſion.

The delineation of the three Ligatures.



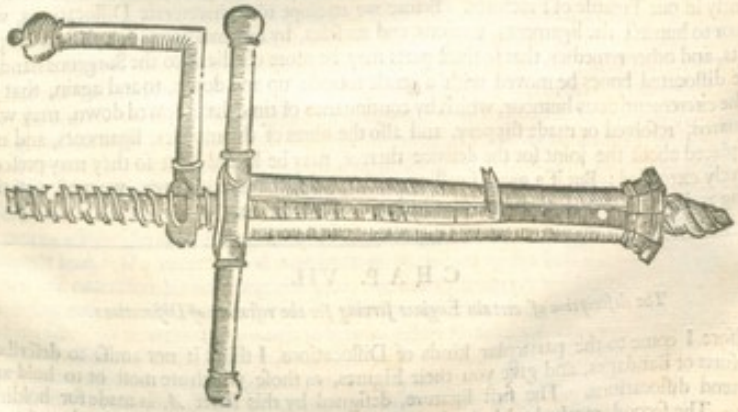
I have thought good alſo to delineate the following Engine, made for to draw and extend more powerfully, when the hand will not ſerve. It is made like a Pulley, marked with theſe Letters *D D*. Within this there lie hid three Wheels, through whoſe furrows runs the rope which is to be drawn, marked with 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 expreſt in this Figure.

Some Practitioners in ſtead of this Pulley, make uſe of this deſcribed Inſtrument, which they term *Manubrium verſatile*, or a Hand-vice. 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 firing or ligature muſt be faſtned. Now the Screw-rod or Male-ſcrew runs into the Female by twining about of

Manubrium verſatile, or a Hand-vice.



the handles; and thus the ligature is drawn as much as will ſuffice, for the ſetting the diſlocated bone. Having delivered theſe things thus in general, now I come to treat of the Luxations of each part, from the Jaw-bone even to the Toes of the Feet.

CHAP.

CHAP. VIII.

Of the Dislocation of a Jaw-bone.

The Causes. Differences.

THe Jaw bone is dislocated by many occasions, and not seldom 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 mamillary 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 swollen whither it is gone; the Patient cannot shut his mouth, but is forced 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 temporal 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 symptoms are more vehement; wherefore it must be set with all speed, otherwise the Patient will presently have grievous pain about his throat, inflammation, a fever, whereupon oftimes death ensues within ten days, 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 fore-mentioned symptoms. Practitioners affirm, that the Jaw twelve days after it is set, is free from the danger of relapse. If it have been dislocated some few days 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 Medicin made of the Whites of Eggs and Oil of Roses to assuage the 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 Medicin: *℞ Pulv. boli armeni. sang. draconis, farinæ volat. masticis. picis, resinæ, an.* ℥ ß. *albuminis ovorum q. s. fiat medicamentum*; afterwards you may use *Emplast. Diacalcitheos* dissolved in Oil of Roses and Vinegar, and other things, as occasion shall be.

Signs that only one part is dislocated.

Signs that both sides are dislocated.

Prognosticks.

Why death quickly ensues upon the dislocation of both sides of the Jaw.

An astringent Medicin.

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 immovable: 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. 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 wooden wedges made of soft wood, as hazle or fir, 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 shall 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 wooden 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. Wherefore he must abstain from hard meats, and such as require much chewing, until his pain be quite passed, and use onely spoon-meats, as Barley Creams, Panadoes, Jellies, Cullasses, Broths, and the like.

Another.

Diet.

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 him lies, shall help forwards the Surgeons endeavour, in opening his mouth as little as he can, lest the muscles should be extended; and he shall onely gape so wide as to admit the Surgeons thumb, for so the temporal 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, 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. Now for restoring it, the Patients head must be straightly holden behind, whilest 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

What the Patient ought to do.

Signs that the Jaw is dislocated backwards.

The Cure.

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 persuade 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 onely but a little thrust back to the throat to those mamillary 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* it can scarcely be depress, for that it is as it were underpropt with the first rib: But it may be dislocated inwardly, outwardly, and side-wise, and according to this variety there must be divers ways 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 bottom 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. *Galen* writes, that when he was five and thirty years old, whilest 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 forty days 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 swells, 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.

The Cure.

Com. ad sent. 62. sect. 1. de art.

CHAP. XII.

Of the luxation of the Spine, or Back-bone.

An anatomical description of the Spine.

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 immovable, 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 exteriour 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 greater 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 spinal marrow shut up therein from external injuries, have also another, which is, they firm and fasten the bones of the ribs by a strong tie. There lies a grisle, and a tough, and (as it were) albuminous humour 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 onely, but not backwards, for that so there would be continual 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 onely to add 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.

The variety of the processes of the Spine.

Gal. cap. 7. lib. 13. de usu partium.

Lib. 13. de usu partium.

CHAP.

CHAP. XIII.

Of the Dislocation of the Head.

The connexion of the head with the first Back-bone of the Neck.

THe Head ſtands upon the Neck knit by dearticulation to the firſt *Vertebra* thereof, by the interpoſition of two proceſſes which ariſe from the *baſis* thereof, near the hole through which 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 ſpinal marrow is too violently and hard compreſſed, bruiſed and extended, the chin is faſtned to the breſt, 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.

Prognoſticks.

CHAP. XIV.

Of the Diſlocation of the Vertebræ, *or Back-bones of the Neck.*

The danger hereof.

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 oppreſſed at the very original 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 it 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 lie with his whole weight upon his ſhoulders; 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, until 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.

Signs and ſymptoms of their ſubluxation.

The Cure.

Signs of their reſtitution.

CHAP. XV.

Of the Diſlocated Vertebræ *of the Back.*

Differences and ſigns.

THe Back-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 internal or external, as is common to all other Luxations; the internal is either the defluxion of humours 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 external is a fall from high upon ſome hard body, a heavy 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, unleſs by a great deal of violence; and if it at any time happen, it is not but with the breaking of the ties and ligaments, for they will break rather than ſuffer ſo great extenſion. Such a Diſlocation is deadly, for that the ſpinal marrow is exceedingly violated by too ſtrait compreſſion, whence proceeds dulneſs, and loſs 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 mind, 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 carried more inwardly into the body. Beſides the preſſed ſpinal marrow becomes inflamed, and that being inflamed, the parts of the ſame kind, and 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 follows the deprivation of the ſenſe and motion in the parts whereto they are carried, therefore the contained excrements do no more provoke to expulſion by their troubleſom ſenſe, neither are preſſed to keep them in: thence proceeds their ſuppreſſion, and hence their breaking forth againſt their wills. But the ſpine outwardly diſlocated, ſcarce cauſes any compreſſion of the marrow or nerves.

Cauſes.

The danger of a *Vertebra* diſlocated inwards.

Hipp. ſect. 51. ſect. 3. de art. & Gal. in com.

CHAP. XVI.

How to restore the Spine outwardly dislocated.

The Cure. 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

Another manner of cure. 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 you lie with your hands upon the extuberancies, & force in the prominent *vertebra*. But if it cannot be thus restored, then will it be convenient to wrap two pieces of wood, of four fingers long, and one thick, more or less, 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*, until you force them back into their seats, just after the manner you see it before delineated.

How to keep the restored *Vertebræ* in their places. In the mean while have a care that you touch not the processes which stand up in the ridge of the Spine, for they are easily broken. You may know that the *Vertebræ* are restored by the equal smoothness 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 onely 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.

CHAP. XVII.

A more particular enquiry of the dislocation of the Vertebræ, *proceeding from an internal cause.*

THe *Vertebræ* are in like sort luxated by the antecedent cause, as we have formerly said, which is caused by the natural imbecillity of the parts, principally of the nervous ligament, by which all the *Vertebræ* are bound each to other; this ligament comes not to the spinal marrow, but onely binds together the *Vertebræ* on their out-sides: 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 while 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 humour for the freer motion of the *Vertebræ*. Sometimes another cold, crude, gross and viscid humour, confused and mixed herewith by great defluxions and catarrhs, begets a tumour, which doth not onely 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 *Crookednesse*,) 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 calls it a *Scisis*, or shaking. They also note another defect peculiar to the spinal 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 depress the spinal marrow, or by any other means remove, or put it forth of its place. Scarce any recovers of this disease, for many reasons, which

Cyphosis. Lordosis. Scoliosis. Com. ad Sent. 2. sect. 3. l. de art. Scisis.

The separation of the spinal marrow from the encompassing *Vertebræ*.

which any exercised in the Art, may easily think upon: But let us return to the internal cause of Luxations. Fluid and soft bodies, such as Childrens, usually are very subject to generate this internal cause of defluxion. If external occasions shall concur with these internal causes, the *Vertebræ* will sooner be dislocated: Thus Nurses, whilest they too straitly lace the brests and sides of Girls, so to make them slender, cause the brest-bone to cast it self in forwards or backwards, or else the one shoulder to be bigger or fuller, the other more spare and lean. The same errour 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 onely 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.

The errour 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 bredth, but run outwards before; therefore the Chest loseth its natural 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 breathe, they are forced to hold up their heads, whence also they seem to have great throats. Now because the Weazon being thus pressed, the breath is carried through a strait passage, therefore they wheaze as they breathe, and snort in their sleep, for that their lungs, which receive and send forth the breath or air, be of less bigness: 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 midriff, 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 less fruitful, and more subject to barrenness, than such as have their crookedness above their midriff. 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 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 brest 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 straitned passages, whence leanness must needs ensue: but the limbs shall thence have no wrong, for that not the whole body, but the neighbouring parts onely 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 onely *Vertebra* is dislocated, it carries the spinal 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 onely into an obtuse angle, or rather a semicircle; by which compression it certainly suffers, but not so, as that death must necessarily ensue thereon. 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.

Hipp. sect. 6. sect. 3. de art.

Why when the spine is luxated, the parts belonging to the chest are nourished and grow the less.

Why the luxation of one *Vertebra* is more dangerous than of many.

sect. 51. sect. 3. lib. de art.

CHAP. XIX.

Of the dislocation of the Rump.

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 painful 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, 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, left the bone, as yet scarce well recovered, should fall again out of its place.

The Signs.

The Cure.

CHAP. XX.

Of the Luxation of the Ribs.

THE Ribs may by a great and bruising stroak be dislocated, and fall from the *Vertebra* whereto they are articulated, and they may be driven inwards, or side-ways. 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, 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

Caused.

Signs.

there is onely a depreſſed cavity where it is knit and faſtned to the *Vertebræ*. Such diſlocations cauſe divers ſymptoms, as difficulty of breathing, the hurt rib hindering 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 humour 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 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 until it be put into its cavity. Again, if the rib ſhall fall out upon the lower ſide of the *Vertebra*, it will be requiſite that the Patient bend his face downwards, ſetting his hands upon his knees; then the diſlocation may be reſtored by preſſing or thruſting in the knot or bunch which ſtands forth. 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.

Cure.

Gal. com. ad ſen. 3. ſect. 1. de art.

CHAP. XXI.

Of a diſlocated ſhoulder.

THe ſhoulder is eaſily diſlocated, beauſe 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. Add hereunto, that there is no internal 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 onely 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, according to each difference of ſite. The ſhoulder-bone, which *Hippocrates* calls the arm-bone, may be diſlocated four manner of ways, upwards, downwards, or into the arm-pit, forwards and outwards, but never backwards, or to the hinder part: For, ſeeing that there the cavity of the blade-bone, which receives the head of the arm-bone, which *Hippocrates* calls a joint, lies and ſtands againſt it; who is it that can but imagine any ſuch diſlocation? In like ſort it is never diſlocated 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 Anchor-like, or beak-like proceſs, all which four hinder this joint from ſlipping inwards. Now *Hippocrates* ſaith, that he hath onely 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 uſual 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 ſhews 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, *ſcbirrus*, 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 ways 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, eunuchs, and women; the fourth, with a ball put under the armpit, 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 ways, and preſent them to your view.

Why there is no internal ligament from the arm-bone to the ſhoulder-blade.

Differences of a luxated ſhoulder. *Sect. 1. ſect. 1. libade art.*

Signs of the ſhoulder diſlocated downwards.

The ways 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 and 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 liſt 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 onely 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 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, whileſt we thought

Gal. com. ad ſent. 23. ſect. 1. de art.

An Expression of the first manner of putting a Shoulder into joint.

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 tied about, a little above the elbow with a fillet, whereto a cord shall be fastned; which being put or fastned to the pulley, shall 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 himself 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 brest, 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 Medicin made *ex farina volatili, bolo armenio, myrtillis, pice, resina & alumine*, beaten into Powder, and mixed with the white of an Egg. 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 *refrigerans 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 ells 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 brest, 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 days be past, unless the greatness of some happening symptom divert us from this our purpose.

A perfect setting the luxated shoulder by extension onely.

CHAP. XXIII.

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.

THe Patient must be laid with his back on the ground upon a coverlid, or mat, and a clew of yarn, or leathern ball, stuffed with Tow or Cotton, of such bigness as may serve to fill up the cavity, must be put under his arm-pit, that so the bone may straight-ways 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 filled up the arm-pit; but if the left, then the left heel; then let him forth-with 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. Whilest this is in doing, one

Hipp. sect. 12. sect. 1. de art.

The expression of the second manner of restoring a Shoulder.

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 ſhall ſit on the other ſide of the Patient, who holding him, ſhall hinder him from ſtirring this way or that way at the neceſſary extenſion in ſetting it, as you may ſee it expreſſed by the precedent figure.

CHAP. XXXIV.

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 arm towards his own breſt, 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 ſhews.

The Figure of the third manner of putting a Shoulder into joint.

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 ſtays, 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 wooden Pins and Ball faſtned in the midſt, delineated by it ſelf.

CHAP.

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 filleting, 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 it ſelf, the endeavour of the Surgeon aſſiſting, and preſſing down the ſhoulder-blade, and moving it to and again. The bone 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, leſt 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

Another Figure expreſſing the fourth manner of reſtoring a diſlocated ſhoulder.

Another Figure to the ſame purpoſe.

not

not thought fit in this place to omit the induſtry of *Nicholas Picart*, the Duke of *Guiſe* 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 aforementioned manner, to a Ladder; then immediately he tied a ſtaff at the lower end of the ligature, which was faſtned about the Patients arm above his elbow; then put it ſo tied 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 foregoing figure.

If you have never a Ladder, you may uſe a piece of Wood laid acroſs upon two Poſts. Alſo you may uſe a Door, as the other Figure ſhews, wherein you muſt obſerve a flat piece of Wood or *ſpatula*, with ſtrings thereat, whoſe uſe ſhall be ſhewn in the following Chapter.

CHAP. XXVII.

The ſixth manner of reſtoring a ſhoulder luxated into the arm-pit.

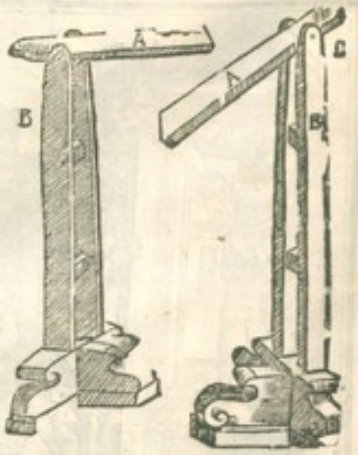
Gal. 1. lib. 1. de art. ſect. 19.

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 breadth, 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. 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 ſeveral places, each alike diſtant from other, through which let ſoft ſtrings be put, whereby it may be tied 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 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 croſs 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 croſs pin muſt be put on ſuch a height that the Patient may ſtand on tip-toes 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, Door, Bed-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 ſucceſs, unleſs 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 natural ſocket or cavity. But I muſt here admoniſh young Surgeons, that if the bone be not reſtored at the firſt endeavour and on-ſet, that they do not deſpair and preſently deſiſt from their intended operation, but they muſt winde about, and gently move the joint: for ſo at the length it will be more eaſily moved, and enter into the natural cavity: When it is in, it muſt be bound up with compreſſes and rowlers after the fore-mentioned manner.

The deſcription of the Gloſſocomium, termed Ambi.

Gal. 1. de art. ſect. 21.

Hippocrates *his* Gloſſocomium *termed* Ambi.



To the former Figures I have thought good to add 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* Shews the wooden *ſpatula*. *B* The frame or ſtanding poſts.

Hipp. ſect. 64. 4. de artic.

How to make uſe of the *Ambi*.

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 tied, that he may not raiſe him ſelf up whileſt the Surgeon endeavours to reſtore it. Now he ſhall then endeavour 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

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.

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 knowledge whereof, beſtowed upon me by the inventor himſelf, I would not envy the ſtudious Reader.

Another Figure of an Ambi *with the Additaments.*

AA *Shews the two ears, 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 ſeldom 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 joynt, whoſe articulations are ſtrengthned for the firmer connexion with fleſhy, nervous, griſtly and bony ſtays, 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 profeſs 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

Com. ad ſect. 22 & 23. ſect. 1 de articulis.

of

Cure. of the ſhoulder wreſted out towards the breaſt, as alſo the Patient cannot bend his elbow: It is reſtored by the ſame means 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, until 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 foreparts of the dearticulation ſhut up with muſcles, opened both to the outer, as alſo the inner part, you muſt work to the contrary; to wit, to the hind part: But firſt of all you muſt place a ſervant at the back of the Patient, who may draw back a ſtrong and broad Bandage caſt about the arm-pit (ſuch as is the *Carcheſius*, which conſiſts of two contrary and continued ſtrings) leſt that when the arm ſhall be extended, the ſhoulder follow: Alſo you muſt *Sect. 23. fill. 1. de art.* 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 fore-mentioned clew under the arm, and drawing the head another way; then muſt you perm it, by ſlacking your extenſion, the joynt 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.

CHAP. XXIX.

Of the ſhoulder luxated outwardly.

Signs. THe diſlocation alſo of the ſhoulder to the outward parts ſeldom 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 The cure. 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 medicines What to be done to hold in the ſhoulder after it is reſtored. ſhall be put about the joynt. Let there be ſomewhat put into the arm-pit which may fill it up, and let compreſſes or boulſters be applied to that part to which the luxated bone fell; 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 joynt of the ſhoulder, and thence carried 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 painful, and conſequently, ſuch as the arm may ſtand the longeſt therein without moving.

CHAP. XXX.

Of the Shoulder diſlocated upwards.

Signs. THe head of the ſhoulder alſo may ſometimes be luxated into the upper part: Which when it happens, it ſhews it ſelf by bunching forth at the end of the collar-bone, the hollowneſs of the arm-pit is found larger than uſual, the elbow flies further from the ribs than Cure. when it fell downwards, now the arm is wholly unable to perform the uſual 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 therewithal 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 applied to that part whereto the bone flew, and it being alſo bound up with ligatures. Now you may underſtand in theſe four fore-mentioned 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.

CHAP.

CHAP. XXXI.

Of the Diſlocation of the Elbow.

THe elbow may alſo be four manner of ways 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 natural 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 joynt of the elbow conſiſts of more heads and cavities than that of the ſhoulder, by ſo much when it is luxated it is the more difficultly ſet, and is alſo more ſubject to inflammation, and to grow hard thereupon, as *Hippocrates* ſaith. Now the joynt 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 flies and departs out of its place as beaten or forced thence, and this kind of luxation is far more difficultly reſtored than the former: Add 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 proceſs ſtays in the external 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 proceſs 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 natural figure thereof is perverted, for the 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 befal it, the action of the elbow will either not be at all, or certainly not well, until 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 complete and perfect, another imperfect. The later 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 unleſs 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.

The Author ſeems not to agree with *Hip. Sent. alt. ſect. 3. frall.* 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; thoſe *Celſus* hath attributed to a diſlocation to the out and inſides.

Inflammation hinders repoſition.

CHAP. XXXII.

How to reſtore the Elbow, diſlocated outwardly.

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 bitterneſs of pain uſually cauſeth, upon what part ſoever the luxation happens. 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 joynt 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 eminence 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 expreſly 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 proceſs of the cubit poſſeſſeth the place of the exterior proceſs 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 poſt, then muſt the end of cubit called *Olecranum* be tied or bound about with a ſtrong ligature or line, and then reſted into its cavity by putting a battoon or ſtaff into the ligature, as is demonſtrated by this enſuing figure.

Signs.

Cure.

A Caution.

A Figure which ſhews the way how to reſtore the Elbow by putting it about a poſt, with a batton.

A Figure which ſhews how to reſtore the Elbow by only caſting a line about it.

Thereis alſo another more exquiſite way of reſtoring it, which is expreſſed by the latter figure wherein a line of ſome inch breadth is caſt about the *Olecranum* 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 natural conformation is reſtored to the arm, and the bending and extending thereof is eaſie, and not painful.

CHAP. XXXIII.

Of the Diſlocation of the Elbow to the inſide, and of a complete and uncomplete Luxation.

The cure.

IF the elbow be diſlocated to the inner part, the arm muſt be 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 bout of the elbow, and upon that do ſuddenly force the elbow to the ſhoulder, as we have formerly ſaid. If the cubit-bone be only 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 arm, taking hold thereof at the ſhoulder and wriſt, and each draw towards himſelf: 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, he ſhall lay the arm in a ſtrait angle, and ſo bind it up, and apply fit medicines formerly mentioned, and ſo let him carry it in a ſcarf 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 arm, yea, and alſo to attempt to lift up ſome heavy thing with his hand; for ſo it will come to paſs, that the ligaments of this joynt may become more ſoft, ready and able to perform their accuſtomed functions, and alſo the bones of the cubit and ſhoulder ſhall be freed from the affect termed *Ancyloſis*, whereto they are incident by the luxations of this part. Now *Ancyloſis* is a certain preternatural agglutination, coagmentation, and, as it were, union of ſundry and ſeveral bones in the ſame joynt, 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 joynt, by reaſon that by reſt and ceſſation from the accuſtomed actions, a viſcid humor which is placed naturally in the joynts, as alſo another which is preternatural drawn thither by pain, floweth down, and is hardned, and gleweth the bones together, as I have obſerved in many, by reaſon of the idleneſs 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 arm muſt be gently moved every way. Within the ſpace of twenty, or twenty five days, theſe reſtored Bones recover their ſtrength, ſooner or later, according to the happning 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 he muſt be mindful in ſetting the cubit, that he alſo reſtore the

Sect. 63. ſect. 3. de fract.

Why the elbow is moſt ſubject to *Anchyloſis*.

the wand to its place; in the upper part it hath a round process lightly hollowed, wherein it receiveth the shoulder-bone: it hath also an eminency which admitteth the two headed muscle.

CHAP. XXXIV.

Of the Dislocation of the Styliformis, or bodkin-like process of the Cubit or Ell.

THE process 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 bind it, and apply thereto very astringent and drying medicines: But yet, though you shall diligently perform all things which may be done in dislocations, yet you shall never so bring it to pass that this bone shall be perfectly restored, and absolutely put into the place where-hence it went: Which thing we have read, observed by *Hippocrates*; When (saith he) the greater bone, to wit, the Ell, is removed from the other, that is, the Wand, it is not easily restored to its own nature again; for that, seeing that neither any other common connexion of two bones, which they call *Symphysis* or union, when it is drawn 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.

Differences and causes.

Cure.

Sect. 1. sect. 2. & sect. ult. sect. 3. de fract.

CHAP. XXXV.

Of the Dislocation of the Wrist.

WE understand by the wrist, a certain bony body, consisting of a composure of eight bones knit to the whole cubit by *Diarthrosis*: For the wrist considered wholly in its self, 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 joynt is made more firm; yet may it be dislocated inwardly, outwardly, and towards the sides. We say it is luxated inwardly when the hand stands upwards, but outwardly, when it is crook'd in and cannot be extended: But if it chance to be dislocated side-ways, it stands awry either towards the little finger, or else towards the thumb, as the luxation befals to this or that side. The cause hereof may seem 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 thumb, by its upper part, whilst it receives the outward swelling or condyle of the ell in its cavity, performs 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 arm on one side and the hand on another must be extended upon a hard resisting and smooth place, so that it may lie 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, until by the force of compression and site the luxated bones be thrust and forced into their places and cavities.

Here, as before *chap.* 31. the Author dissents from *Celsus* and *Hippocrat.* in expressing the names and signs of these dislocations.

CHAP. XXXVI.

Of the dislocated bones of the Wrist.

THE wrist consists of eight bones, which cannot, unless by extraordinary violence, be put or fall out of their places. Yet if they shall at anytime fall out, they will shew it by the tumor of the part whereto they are gone, and by the depression of that wherefrom they are fled: They may be restored, if the diseased hand be extended upon a table; and if the bones shall be dislocated inwards, the hand shall be placed with the palm upwards, then the Surgeon shall, with the palm of his hand, press down the eminencies of the bones, and force each bone into its place: But if the luxation be outwards, he shall lay the palm next to the table, and press 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 scarf.

Sign.

Cure.

CHAP. XXXVII.

Of the dislocated bones of the After-wrist.

THERE are four bones in the palm or after-wrist, the two middlemost whereof cannot be dislocated side-ways, because 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-fingers rest, be dislocated towards that side which is next the middle bones, whereof we now spake, but only on the other side, freed for the neighbour-hood of the bones: But all of them may be dislocated inwardly and outwardly. They may be restored as those of the wrist.

Celsus lib. 8. cap. 18.

CHAP. XXXVIII.

Of the diſlocated Finger.

Why the diſlocated fingers may be eaſily reſtored.

ALſo the bones of the fingers may be four ſeveral ways diſlocated, inwardly, outwardly, and at each ſide. To reſtore them, they muſt be laid ſtrait upon a table, and ſo put into joynt again. For thus they may be eaſily reſtored, by reaſon their ſockets are not deep, and their joints are ſhorter, and ligaments leſs ſtrong. In twelve days ſpace they will recover their ſtrength, as alſo thoſe diſlocations that happen to the wriſt and after-wriſt.

CHAP. XXXIX.

Of a diſlocated Thigh or Hip.

Hipp. ſent. 68. ſect. 3. de art.

THe thigh or hip may be diſlocated, and fall forth towards all the four parts, but moſt frequently inwards, next to that outwards, but very ſeldom either forwards or backwards. A ſubluxation cannot happen in this joynt, as neither in the ſhoulder, eſpecially from an external cauſe, contrary to which it uſually happens in the elbow, hand, knee, and foot. The cauſe hereof is, for that the heads of thigh and ſhoulder-bone are exactly round, and the ſockets which receive them have certain borders and edges encompaſſing them: Hereunto may be added, that ſtrong muſcles encompaſs each dearticulation, ſo that it cannot come to paſs that part of the heads of ſuch bones may be contained in the cavity, and other parts ſtand or fall forth, but that they will quickly be reſtored to their places by the motion and wheeling about of the joynt, and the ſtrength of the encompaſſing muſcles. But a ſubluxation may ſeem to happen in theſe parts from an internal cauſe. For then the ligaments and ties being ſoftned and relaxed, cannot draw and carry back the head of the bone ſtanding forth ſo far as the edges of the ſocket. If the hip be diſlocated towards the inner part, that leg becomes longer and larger than the other, but the knee appears ſomewhat lower, and looks outwardly with the whole foot, neither can the Patient ſtand upon his leg. To conclude, the head of the thigh-bone bewrays it ſelf lying in the groin, with a ſwelling manifeſt both to the eye and hand; now the leg is longer than that which is ſound, for that the head of the thigh is out of its ſocket or cavity, and ſituated lowered, to wit, in the groin, therefore the leg is made by ſo much the larger. Now the knee ſtands forth, becauſe neceſſarily the lower head of the thigh-bone ſtands contrary to the ſocket. For this is common to all diſlocated bones, that when as the diſlocation happens to the one ſide, the other end of the bone flies out to the contrary. 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 happens in other diſlocations. The leg cannot be bended towards the groin, for that the diſlocated bone holds the extending muſcles of the ſame part ſo ſtiffly ſtretched out, that they cannot yield, or apply themſelves to the benders. For flexion or bending ought to precede extenſion, and extention, flexion.

Gal. com. ad ſect. 47 ſell. 4. de art.

A ſubluxation may befal the thigh from an internal cauſe.

CHAP. XL.

Prognoſticks belonging to a diſlocated Hip.

Why the thigh bone diſlocated, is difficultly reſtored, or reſtored, eaſily falls out again.

THere is this danger in the diſlocation of the hip, that either the bone cannot be put into the place again, at leaſt unleſs with very much trouble, or elſe being 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 be hard and ſtrong, they, by reaſon of their contumacy and ſtiffneſs will hardly ſuffer the bone to return to its place. If that they be ſoft, looſe, effeminate and weak, they will not contain the reſtored bone in its place. Neither will it be any better contained, if that ſhort, but yet ſtrong and round ligament, which faſtens the head of the thigh-bone on the inſide in the ſocket or cavity of the huckle-bone, be broken or relaxed. Now it may be broken by ſome violent ſhock or accident, it may be relaxed by the congeſtion and long ſtay of ſome excrementitious, tough and viſcous humour lying about the joynt, through which means it waxeth ſoft. But if it be broken, how often ſoever the bone be reſtored, it will preſently fall out again. If it be relaxed, there is only this hope to contain the reſtored bone, that is, To conſume and draw away the heaped up humidity by application of Medicines and Cauteries of both kinds, for which purpoſe thoſe are more effectual which do actually burn, for that they dry and ſtrengthen more powerfully. Leanneſs of the body, and the want of *Aponeuroſes*, that is, of broad tendons, and external ligaments, whereof many encompaſs the knee, increaſes the difficulty of containing it in the place. But the parts adjoyning to the diſlocated and not-ſet bone fall away by little and little, and conſume with an *Atrophia* or want of nouriſhment; both becauſe the part it ſelf is forced to deſiſt from the accuſtomed actions and functions, as alſo for that the veins, arteries and nerves being more ſtraitned and put out of their places, hinder the ſpirits and nouriſhment frow flowing ſo freely as they ought, to the part: Whence it comes to paſs, that the part it ſelf is made more weak, the native heat being debilitated through idleneſs, it can neither attract the alimentary juice, neither can it digeſt and aſſimilate that little thereof which flows and falleth thereto. Verily the thigh-bone, as long as it is forth of the cavity, grows no more after the manner as the other bones of the body do, and therefore in ſome ſpace of time you may perceive it to be ſhorter than the ſound bone. Notwithſtanding the bones of the leg and foot are not hindred of their growth,

The breaking and relaxation of the internal ligament.

Gal. com. ad ſect. 42. ſell. 4. de art.

growth, for they are not out of their proper places. Now for that the whole leg appears more slender, you must think that happens only by the extenuation and leanness of the proper muscles thereof. The same thing happens to the whole hand, in the largest acception, when as the shoulder is out of joynt, unless that the calamity and loss hereof is the less. For the shoulder being forth of joynt you may do something with your hand, whereby it will come to pass that no small portion of nourishment may flow down into these parts. But the thigh-bone being dislocated, especially inwards in a child unborn, or an infant, much less alimentary nourishment flows to that part, because it can much less use the foot and leg by reason of the dislocation of the hip, than it can do the hand by a luxation of the shoulder. But now we must thus understand that which is said by *Hippocrates*, That dislocated bones, and not restored, do decrease or are hindred from their just growth, to be only 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, become more slender, but yet no shorter, as appears by that which he hath delivered of the shoulder.

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 some time the pain is assuaged, and flesh grows about it, the head of the bone wears it self a new cavity in the adjoyning hip, whereinto it betakes 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* observes in the dislocation of the *Vertebræ* to the inside; therefore it comes 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 be not restored to its joynt again, then they must cast their leg about as they walk, just as we see Oxen do. Wherefore the sound leg whilst they go, takes much less space than the lame, because this, whilst it stirreth or moveth, must necessarily fetch a compass about, but that performeth its motion in a right line. Besides, whilst the Patients stand upon their lame leg to put forwards the sound, they are forced to stand crooked, whereupon they are forced to stay themselves with a staff that they fall not.

Al sect. 51. sect. 3. de art.

Furthermore those who have this bone dislocated either backwards or outwards, so that it cannot be restored, have the part it self grow stiff and hard; which is the cause why the ham may be 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 themselves by laying their hand on their lame thigh at every step, both for that their lame leg is the shorter, as also because the whole weight of the body should not lie wholly or perpendicularly upon the joynt 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 becomes more deformed in the compasure and figure, because, whilst it succours the opposite and lame leg by the firm standing on the ground, it bears the weight of the whole body, in performance whereof the ham must necessarily now and then bend. But on the contrary, when as the head of the thigh being dislocated inwards is not put into the joynt, if the Patient be arrived at his full growth, after that the head of the bone hath made it self a cavity in the neighbouring bone wherein it may rest, he may be able to walk without a staff, because the dislocated leg cannot easily be bended toward the groin or ham, and he will sooner rest upon his heel than upon his toes. This kind of dislocation if it be inveterate, can never be restored. And these things happen, when as the thigh-bone is dislocated inwards, or when the internal ligament which fastens the dearticulation shall be broken or relaxed. But the contrary shall plainly appear if the dislocation shall happen to be outwards; for then the lame leg becomes the shorter, because the head of the thigh flies into a place higher than its cavity, and the muscles of that part are contracted towards their original, and convulsively draw the bone upwards 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 be bended, which it cannot be in a dislocation of the thigh inwards, as *Paulus* shews. Therefore we must diligently observe that sentence of *Hippocrates* which is read with a negative, in these words, *Sed neque conflectere quemadmodum sanum crus possunt*, that they ought to be read with an affirmative after this manner, *Sed conflectere, &c. quin & crus ipsum, &c.* But now the lame leg will better sustain the weight of the body in an external, than in an internal dislocation; for then the head of the thigh is more perpendicularly subject to the whole weight of the body. Therefore when in the success of time it shall by wearing have made it self a cavity in the neighbouring bone, which in time will be confirmed, so that there will remain no hope of restoring the dislocation, nevertheless the Patient shall be able to go without a staff, for that then no sense of pain will trouble him; whence it follows, that the whole leg also will become less lean, for that going is less 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. l. 6. c. 8. Hip. sect. 91. sect. 3. lib. de artic.

CHAP.

CHAP. XLII.

Of the Thigh-bone diſlocated forwards.

IT ſeldom hapneth 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 contrary 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 for the fore-muſcle which ariſeth from the hanch bone is ſo preſſed by the head of the thigh, that it cannot be diſtended; neither can the ham be bended without very much pain. But the ſame leg is equal at the heel with the other leg, yet the Patient cannot ſtand upon the ſetting on of the toes; therefore when he is forced to go, he toucheth the ground with his heel only, yea verily the ſole of his foot is leſs inclined to the foreſide, neither doth it ſeldom happen, that the urine, by this accident, is ſuppreſt; becauſe the head of the thigh oppreſſes 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 ſeize upon the *Spinæ*-muſcle, the urine can ſcarcely flow out, for that it is hindred 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 thigh-bone diſlocated backwards, becauſe the hind-part of the cavity of the huckle-bone is deeper and more depreſſed than the force; whence it is that the diſlocation of the thigh to the inner part is more frequent than the reſt. The Patient can neither extend nor bend his leg by reaſon of the much compreſſion and tention of the muſcles which encompaſs the head of the thigh by this kind of luxation. But the pain is increaſed when he 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 depreſt with a manifeſt cavity. The heel touches 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 kind of diſlocation than the reſt: Whence it is, that the Patient cannot bend his knee, becauſe the extention of the nervous production or large tendon which covers the knee is ſo great. But if the Patient will ſtand upon the foot of his luxated leg without a ſtaff, he ſhall fall down backwards, for that the body is inclined to that part, the head of the thigh being not directly underneath for the propping or bearing up of the body; wherefore he is forced to ſuſtain himſelf upon a crutch on his lame ſide. Having promiſed theſe things of the differences, ſigns, ſymptoms and prognoſticks, it now remaineth, that we briefly deſcribe the different ways of reſtoring 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 ſome ſoft quilt or coverlid under him, that he 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 be diſlocated outwards or backwards, then muſt the Patient be laid groveling; if inwardly, upon his back; if forwards, then upon his ſide. Then muſt extenſion and impulſion be made towards the cavity, that ſo it may be forced thereinto: But if the diſlocation be freſh, and in a ſoft body, as a woman, child, and ſuch like, whoſe joynts are more lax, it ſhall not be any ways needful to make great extenſion with ſtrong ligatures for the reſtoring it; the Surgeons hand ſhall ſuffice, or a lift or towel caſt about it. In the interim the bone ſhall be kept faſt with compreſſes applied about the joynt: Then the Surgeon ſhall extend the thigh, taking hold thereof above the knee, in a ſtrait line, and ſo ſet it directly againſt the cavity, and then preſently thruſt it thereinto. For thus ſhall he reſtore it, if ſo be that in thruſting it he lift up the head thereof ſomewhat higher, leſt the lips of the cavity force it back, and hinder it from entring. Now becauſe unleſs there be juſt extenſion, there can be no reſtitution hoped for, it is far better in that part, that is, to extend in ſomewhat more than is neceſſary, yet ſo, that you do not endanger the breaking of any muſcles, tendon or other nervous body. For that as *Hippocrates* writes, when as the muſcles are ſtrong and large, you may ſafely extend them, if ſo be 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 being 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 themſelves from this ſad ſpectacle, and that the Surgeon be reſolute, and not deterred from his buſineſs by the lamentation, neither of the Patient nor his friends. But for that we write theſe things chiefly for the benefit of young Practicioners, it ſeemeth meet, that having delivered theſe things in general, of reſtoring the thigh-bone, that we run over theſe generalities in each particular, beginning with that diſlocation which is made inwardly.

Signs.

The general cure.

Sect. 2. lib. de fract.

CHAP. XLIV.

Of restoring the Thigh-bone dislocated inwards.

IT is fit to place the Patient after the foresaid manner, upon a table or bench, in the midst whereof shall stand fastned a wooden pin of a foots length, and as thick as the handle of a spade useth to be; but it must be wrapped about with some soft cloth, left the hardness hurt the buttocks, betwixt which it must stand, as we read that *Hippocrates* did in the extension of a broken leg. The wooden pin hath this use, to hold the body that it may not follow him that draweth or extendeth it; and that the extension being made as much as is requisite, it may go between the *Peritonæum* and the head of the dislocated thigh. For thus there is no great need of counter-extension towards the upward parts; and besides it helpeth to force back the bone into its cavity, the help of the Surgeon concurring, who twining somewhiles 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 we have mentioned in the restoring of a dislocated shoulder, to be drawn above the shoulder. One of these shall be fastned above the joynt of the hip, and extended by a strong man; another shall be cast above the knee by another with the like force. But if you cannot have a wooden pin, another strong and like ligature shall be put upon the joynt directly at the hip, and held stiff by the hands of a strong man, yet so that it may not touch the head of the thigh by pressing it, for so it would hinder the restoring thereof. This manner of extension is common to four kinds of luxation of the thigh-bone. But the manner of forcing the bone into its cavity must be varied in each, according to the different condition of the parts whereunto the head inclineth; to wit, it must be forced outwards if it be fallen inwards, and contrary in the rest, as the kind of the dislocation shall be. Some too clownish and ignorant knot-knitters fasten the lower ligature below the ankle, and thus the joynts of the foot and knee are more extended than that of hip or huckle-bone, for they are nearer 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 writ, but above the elbow. But if the hands shall not be sufficient for this work, then must you make use of engines. Wherefore then the Patient being placed as is fit, and the affected part firmly held, some round thing shall be put into the groin, and the Patients knee, together with his whole leg, shall be drawn violently inwards, towards the other leg. And in the mean while the head of the thigh shall be strongly forced towards the cavity of the huckle-bone, and so at length restored, as the following figure shews:

Gal. 2. lib. de fract.

How to make extension and counter-extension in this kind of fracture.

Ligatures made for extension must be fastned near the part to be 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 yield themselves more pliant, then must the rope be somewhat slacked, and then you must also desist from tending, otherwise the restitution cannot be performed, for that the stronger extension of the engine will resist the hand of the Surgeon, thrusting and forcing it into the cavity. This precept must be observed in the restoring of this and other dislocations. You shall know that the thigh is restored by the equality of the legs, by the free and painless extension and inflection of the lame leg. Lastly, by the application of agglutinative medicines (whereof we have formerly spoken) the restored bone shall be confirmed in its place; to which purpose ligation shall be made, the ligature being 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 loyns. In the mean while the cavity of the groin must be filled with somewhat a thick bolster, which may keep the head of the bone in the cavity. Neither must you omit junks stretched down even to the ankles, as we have observed in the fracture of the thigh. Then must both the thighs be bound together, whereby the dislocated member may be unmoveable, and more and more strengthned. Neither must this dressing be loosed until four or five days be passed, unless peradventure the sudden happening

A general precept.

ning of ſome other more grievous ſymptom ſhall perſwade otherwiſe. To conclude, the Patient muſt be kept in his bed for the ſpace of a month, that the relaxed muſcles, nerves 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 conſiſts in the extenſion, not in the flexion, as it is demonſtrated by *Hippocrates*, for that ſuch a figure is accuſtomable to the leg.

Sect. 2. lib. de fract.

CHAP. XLV.

Of reſtoring the Thigh diſlocated outwardly.

THe Patient muſt be placed groveling upon a table in this kind of diſlocation alſo, and ligatures as before, caſt upon the hip and lower part of the thigh, then extenſion muſt be made downwards, and counter-extenſion upwards; then preſently the head of the bone muſt be forced by the hand of the Surgeon into its place. If the hand be not ſufficient for this purpoſe, our Pulley muſt be uſed, as the following figure ſheweth.

A Figure which expreſſeth the manner of reſtoring the Thigh luxated outwards.

When it is that only extenſion ſerves for the reſtoring the diſlocated thigh.

This kind of diſlocation is the eaſilieſt reſtored of all thoſe 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 cavity, by the only regreſs of the extended muſcles into themſelves towards their originals, ſomewhiles with a noiſe or pop, otherwhiles without; which being done, laying a compreſs upon the joynt, you ſhall perform all other circumſtances as before, in an internal diſlocation.

CHAP. XLVI.

Of reſtoring the Thigh diſlocated forwards.

WHen the thigh is luxated forwards, the Patient muſt be laid upon his ſound ſide, and tied as we have formerly delivered. Then the Surgeon ſhall lay a bouliſter upon the prominent head of the bone, and have a care that his ſervant firmly hold it: Then immediately juſt extenſion being made, he ſhall with his hand force the bone into the cavity; but if his hand will not ſerve, he ſhall attempt it with his knee. Then to conclude, he ſhall uſe the reſt of the things formerly mentioned to contain the reſtored bone.

CHAP. XLVII.

Of reſtoring the Thigh diſlocated backwards.

THe Patient ſhall be 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 endeavour to force back with his hand that which ſtands up, and alſo to draw away the knee from the ſound leg. The bone thus placed and reſtored, the cure requires nothing elſe than to be bound up and kept long in bed, leſt that the thigh, if it ſhould be moved, the nerves being yet more looſe, might again fall out: For the thigh is in great danger of relapſe, for that the cavity of the huckle-bone is only depreſt, as far as it goes in, and the burthen of the hanging or adjoyning thigh is heavy.

CHAP.

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, because the bones which it covers do not suffer it. To restore it, the Patient must stand with his foot firmly upon some even place, and then the Surgeon must force and reduce it with his hands from the part into which it is preternaturally slidden. When it shall be restored, the cavity of the ham shall be filled up with boulsters so that he may not bend his leg, for if it be bended, there is no small danger of the falling back of the whirl-bone. Then a case or box shall be put about it, on the side especially whereto it fell, being made somewhat flat and round, resembling the whirl-bone it self, and it shall be 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 try and accustom by little and little to bend his knee, until at length he shall find that he may easily and safely move that joynt.

CHAP. XLIX.

Of the dislocated Knee.

THe knee also may be dislocated three manner of ways, that is, into the inner, outer and hind-part, but very seldom towards the fore-side, and that not without some grievous and forcible violence; for the whirl-bone lying upon it, hinders it from slipping out, and holds it in. The other ways are easie, because the cavity of the leg-bone is superficiary and very smooth, but the cavity of the lower end of the thigh-bone is made in the manner of a spout or gutter, and besides, the head thereof is very smooth and slippery; but the whole joynt is much more lax than the joynt of the elbow: So that as it may be the more easily dislocated, so may it the better be restored; and as it may be the more easily, so may it be the more safely dislocated, for that inflammation is less to be feared here, as it is observed by *Hippocrates*. Falls from high, leaping, and too violent running are the causes of this dislocation. The sign thereof is the disability 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 forcing of the bones into their seats from those parts whereunto they have fallen. But to restore a dislocation made backwards, the Patient shall be placed upon a bench of an indifferent height, so that the Surgeon may be behind 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 midst of a staff, let one put this into the cavity of the ham, upon the place whereas the bone stands out, and so force it forwards; then let another cast a ligature of some three fingers breadth upon his knee, and draw it upward with his hands, then presently and at once they shall so bend and 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 be dislocated forwards (which seldom happens) the Patient shall be placed upon a table, and a convenient ligation made above, and another close beneath the knee. Then the Surgeon shall so long press down with both his hands the bone which is out of joynt, until it shall return to its place gain. To which purpose if the strength of the hand will not serve to make just extension each way, you may make use of our engine, as you may perceive by this following figure.

The cure.

A Figure shewing the manner of restoring a Knee dislocated forwards.

You

You shall know that the bone is restored by the free and painless extension of the leg; then will there be place for medicines, boulsters 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 joyning of the leg and shin-bones.

THe *Fibula* or lesser Focile is fastned and adheres to the *Tibia*, leg-bone, or greater Focile without any cavity, above at the knee, and below at the ankle. But it may be pluck'd or drawn aside three manner of ways, that is, forwards, and to each side: This chance happens when in going we take no sure footing, so that we slip with our feet this and that way as in a slippery place, and so wrest it inwards or outwards; for then the weight of our body lying open upon it, draws 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 some grievous and bruising blow: Besides also, their appendices are sometimes separated from them. For the restoring of all these into their proper places, it is fit they be drawn and forced by the hand of the Surgeon into their seats: Then shall they be 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 forty days, to wit, as long as shall be 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 sometimes dislocated and divided from the Pastern-bone, as well inwardly, as outwardly; which may be known by the swelling out of the bone to this or that part; if it be only a subluxation or strain, it may be easily restored by gently forcing it into the place again. After the bone shall be restored, it shall be kept so by compresses and fit deligation, by cross and contrary binding to the side opposite to that towards which the bone fell, that so also in some measure it may be 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 kind of dislocation is restored in forty days, unless some 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 heavy upon their heel, have their heel dislocated and divided from the Pastern-bone. This dislocation happens more frequently inwardly than outwardly, because the prominency of the lesser Focile embraces the Pastern-bone; whence it is that there it is more straitly and firmly knit. It is restored by extension and forcing it in, which will be no very difficult matter, unless some great defluxion or inflammation hinder it. For the binding up it must be straitest in the part affected, that so the blood may be pressed from thence into the neighbouring parts; yet using such a moderation, that it may not be painful, nor press more straitly than is fit, the nerves and gross tendons which runs 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 vehemency 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 necessary in the fracture of a heel. *Hip. sect. 3. de fracturis.*

IT happenth by the vehemency of this contusion, that the veins and arteries do, as it were, vomit up the 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 Surgeons help, to wit, convenient diet, and drawing of blood by opening a vein, (of which though *Hippocrates* makes 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 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 oyl) so that divers times we 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 seize upon the part, otherwise there will be danger of a convulsion. For the blood, when it falls out of the vessels, readily putrifies, by reason the density of this part hinders it from ventilation and dispersing to the adjacent parts. Hereto may be added, that the large and great tendon which covers the heel, is endued with exquisite sense, and also the part it self is on every side spread over

Why the heel is subject to inflammation.

with

with many nerves. Besides also there is further danger of inflammation by lying upon the back and heel, as we before admonished you in the fracture of a leg. Therefore I would have the Surgeon to be here most attentive and diligent to perform these things which we have mentioned, lest by inflammation a Gangrene and Mortification (for here the sanious flesh presently falls upon the bone) happen together with a continued and sharp Feaver, with trembling, hicketting and raving. For the corruption of this part first by contagion assails the next, and thence a Feaver assails the heart by the arteries pressed and growing hot by the putrid heat, and by the nerves 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 cause convulsions, raving and a deadly hicketting. *Gal. ad sent. 23. sect. 2. lib. de fract.*

CHAP. LV.

Of the dislocated Pastern, or Ancle-bone.

THe *Astragalus* or pastern bone may be dislocated and fall out of its place to every side. Wherefore when it falls out towards the inner part, the soal of the foot is turned outwards, when it flies out to the contrary, the sign is also contrary; if it be dislocated to the forside, on the hind side the broad tendon coming under the heel is hardned and distended; but if it be luxated backwards, the whole heel is, as it were, hid in the foot: neither doth this kind 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. Being 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 sustains and bears up the whole body, may again sink under the burthen, and break out, the sinews being not well knit and strengthned. 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 be luxated, and that either upwards or downwards, or to one side, though seldom side-wise, for the reason formerly rendred, speaking of the dislocation of the like bones of the hand. If that they stand upwards, Cure. then must the Patient tread hard upon some 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 soal of the foot, then must you press them thence upwards, and restore each bone to its place. They may be restored after the same manner if they be 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 happens more from below upwards, or frome above downwards than side-wise. *Sent. 14. sect. 2. lib. de fract.*

CHAP. LVII.

Of the dislocation of the Toes.

NOw the toes may be four ways dislocated, even as the fingers of the hand; and they may be restored just after the same manner, that is, extend them directly forth, and then force each joynt into its place, and lastly, bind them up as is fitting. The restitution of all them is easie, for that they cannot far transgress 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, he must carry it in a scarf. The Patient must rest twenty days, that is, until he can firmly stand upon his feet. The differences. Cure.

CHAP. LVIII.

Of the symptoms and other accidents which may befal a broken or dislocated member.

MAny things may befal broken or dislocated members by the means of the fracture or dislocation; such as are bruises, great pain, inflammation, a Feaver, Impostume, Gangrene, Mortification, Ulcer, *Fistula* and *Atrophia*, all which require a skilful and diligent Surgeon for their cure. A contusion happens by the fall of some heavy thing upon the part, or by a fall from high, whence follows the effusion of blood poured out under the skin: Which if it be poured forth in great plenty, must be 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 dense, by so much the scarification shall be made more deep. You may also for the same purpose apply Leeches. Remedies for a contusion.

Concerning pain we formerly said, that it usually happens by reason that the bones are moved out of their places, whence it hapneth that they become troublesom to the muscles and nerves, by pricking and pressing them. Hence ensue inflammations, as also impostumation and a feaver, 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 strait ligation intercepting the passages of the blood, otherwise ready to fall and flow thither. What may happen by pain.

Remedies for the leanneſs or *Atrophia* of any member.

Now the leanneſs which is occaſioned by too ſtrait ligation receives cure by the ſlackning of the ligatures wherewith the member was bound. That which proceeds from idleneſs, is helped by moderate exerciſe, by extending, bending, lifting up, and depreſſing the member, if ſo be that he can away with exerciſe. Otherwiſe he 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 reſolves the blood that is drawn. But that which is too little or ſhort a ſpace draws little or nothing at all: After the fomentation, hot and emplaſtick medicines made of Pitch, Turpentine, *Euphorbium*, Pellitory of Spain, Sulphur, and the like, ſhall be applied. They ſhall be renewed every day more often or ſeldom, as the thing it ſelf ſhall ſeem to require.

What meaſure to be uſed in fomenting.

A *dropax.*

Theſe medicines are termed *Dropaces*, whoſe form is thus: ℞ *Picis nigræ, ammoniaci, bdelii gummi elemi in aquæ vitæ diſſolutorum an.* ℥ ii. *Olei laurini* ℥ i *pulveris piperis, zinziberis, granorum paradiſi, bacacrum lauri & juniperi, an.* ℥ ii. *Fiat emplaſtrum ſecundum artem, extendatur ſuper alutam.* It is alſo good to bind 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 be bound, beginning your ligation at the hand, and continuing it up to the arm-pit. If this miſchance ſhall ſeize upon the right leg, then the left ſhall be 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 gaping with the veſſels almoſt empty; 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 be more ſtore to refreſh the weak part.

Binding of the ſound part oppoſite to the emaciated.

How to bind up the emaciated part.

Some wiſh alſo to bind up the decaying member with moderate ligation; for thus, ſay they, the blood is drawn thither: for when as we intend to let blood by opening a vein with a lancet, we bind the arm. Alſo it is good to dip it into water ſomewhat more than warm, and hold it there until it grow red, and ſwell; for thus blood is drawn into the veins, as they find, which uſe to draw blood of the *Saphena* and *Salvatella*. Now, if when as theſe things and the like be done, the lame part grows hot, red and ſwoln, then know that health is to be hoped for; but if the contrary happen, the caſe is deſperate: Wherefore you need attempt nothing further.

Signs that an *Atrophia* is curable.

Furthermore, there is ſometimes hardneſs left in the joynts, after fractures and diſlocations are reſtored. It is fit to ſoften this, by reſolving the contained humor, by Fomentations, Liniments, Cataplaſms, emplaſters made of the roots of Marſh-mallows, Briony, Lilies, Line-ſeed, Fenugreek-ſeed, and the like, and alſo of Gums diſſolved in ſtrong Vinegar; as, *Ammoniacum, bdelium, opopanax, labdanum, ſagapenum, ſtyrax liquida*, and *adeps anſerinus, gallinaceus, humanus, oleum liliorum*, and the like. Alſo you muſt with the Patient to move the part ever now and then, every day; yet ſo, that it be not painful to him, that ſo the pent up humor may grow hot, be attenuated, and at length diſcuſſed, and laſtly the part it ſelf reſtored as far as Art can perform it; for oft-times it cannot be helped any thing at all. For if the member be weak and lame, by reaſon that the fracture hapned near the joynt, for the reſidue of his life the motion thereof uſeth to be painful and difficult, and oft-times none at all, eſpecially if the *callus*, which grows there, be ſomewhat thick and great; and laſtly, if the joynt it ſelf ſhall be contuſed and broken by the ſtroke, as it oft-times happens in wounds made by Gunſhot.

BOOK XVII.

Of divers other Preternatural Affects, whoſe cure is commonly performed by Surgery.

CHAP. I.

Of an Alopecia, *or the falling away of the hairs of the head.*

Gal. c. 2. l. 1. de comp. med. ſecun. locos.

The cauſe.

AN *Alopecia* is the falling away of the hair of the head, and ſometimes alſo of the eye-brows, chin and other parts; the French commonly 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 diſeaſe. This affect is cauſed either through defect of nouriſhment fit to nouriſh the hairs, as in old age through want of the radical humidity, or by the corruption of the alimentary matter of the ſame, as after long Feavers, in the *Lues venerea*, Leproſie, the corruption of the whole body and all the humors, whence follows a corruption of the vapors and ſuliginous excrements; or elſe by the vicious conſtitution of pores in the skin in rarity, and conſtriction or denſity, as by too much uſe of hot ointments made for colouring the hair, or ſuch as are uſed to take off hair, therefore called *Depilatoria*, or by the burning of the skin, or loſs thereof, having a ſcar inſtead thereof, by reaſon of whoſe denſity the hair cannot ſpring out; as by too much laxity the ſuliginous matter of the hair ſtays not, but preſently vaniſheth away. The *Alopecia* which comes by old Age, a Conſumption, Burn-baldneſs, Leproſie, a Scald-head, is incurable: That which admits of cure, the cauſe being taken away, is helped. Wherefore if it proceed from the corruption of humors, let a Phyſician be called, who, as he ſhall think fit, ſhall appoint diet, purging and phlebotomy. Then the Surgeon ſhall ſhave off the hair which is remaining, and ſhall firſt uſe reſolving Fomentations, apply Leeches and Horns to digeſt the vicious humour which is under the skin,

What *Alopecia* uncurable.

What curable, and how.

skin, then shall he wash the head to take way the filth with a Lee wherein the roots of Orris and Aloes have been boiled. Lastly, he shall use both attractive fomentations and medicines for to draw forth the humor which is become laudable in the whole body by the benefit of diet fitly appointed. But if the *Alopecia* shall happen through defect of nourishment, the part shall be rubbed so long with a coarse linnen cloth, or fig-leaf, or onions until it wax red; besides also the skin shall be pricked in many places with a needle, and then ointments applied made of *Labdanum*, Pigeons dung, Staves-acre, Oyl of Bays, Turpentine and Wax, to draw the blood and matter of the hairs. If the hair be lost by the *Lues venerea*, the Patient shall be anointed with Quick-silver to sufficient salivation. To conclude, as the causes of this disease shall be, so must the remedies be fitted which are used. Σπυρὶς ἄγρια.

CHAP. II.
Of the Tinea, *or Scald-head.*

THe *Tinea* (let me so term it in Latine, whil'st a fitter word may be found) or a Scald-head, is a disease possessing the musculous skin of the head or the hairy scalp, and eating thereinto like a Moth. There are three differences thereof; the first is called by *Galen*, *Scaly or bran-like*, for that whilst it is scratched it casts many bran-like scales: Some Practicioners term it, *A dry scall*, because of the great adustion of the humor causing it. Another is called, *Ficosa*, *a fig-like scall*, because when it is despoiled of the crust or scab which is yellow, there appear grains of quick and red flesh, like to the inner seeds or grains of figs, and casting out a bloody matter. *Galen* names the third *Achor*, and it is also vulgarly termed, the *Corrosive*, or *Ulcerous scall*, for that the many ulcers wherewith it abounds are open with many small holes flowing with liquid *sanies* like the washing of flesh, stinking, corrupt and Carrion-like, somewhiles livid, somewhiles yellowith. These holes, if they be somewhat larger, make another difference, which is called *Cerion* or *Favosa*, (that is, like a honey-comb) because as *Galen* thinks, the matter which floweth from these, resembleth honey in colour and consistence. They all proceed of an humor which is more or less vicious, for a less corrupt humor causeth a scaly, 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 Nurse, or else presently after it is born, it scarce admits of cure; neither must we attempt that, before the child come that to age that he may be able to endure the cure and medicines. But you may in the mean while apply the leaves of Colworts or Beets besmeared with fresh butter, or other gentle medicine having a faculty 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 scaly scall, softning and discussing fomentations shall be appointed, made of the roots of Marsh-mallows, Lilies, Docks, Sorrel boiled in Lee with a little Vinegar added thereto. The head shall be twice in a day fomented with such a decoction, and on the sixth day, the hair being shaven off, it shall be scarified, and then Leeches and Horns put to it so scarified. Then it shall be forthwith anointed with Oyl of Staves-acre mixed with black-sope, both to draw and repress the malignity of the humor impact in the part. You may also use the following medicine even to the perfect cure of the disease, as that which is much commended in this kind of disease by *Vigo*, *Gordonius* and *Guido*; it is thus made. ℞ *Elleb. albi & nigri, atrament. auripigmenti, litharg. auri, calcis vivæ, vitriol. alum. galla. fulg. ciner. fœtis vini usti, an.* ʒ ß. *Argenti vivi extinct.* ʒ iij. *eruginis æris* ʒ ii. *Fiat pulvis qui incorporetur cum succo boraginis, scabiosæ, fumariæ, oxylapathi aceti, an. quant. s. Olei antiqui lib. i. ad liant usque ad consumpt. succorum in fine decoctionis cineres ponantur, addendo picis liquidæ* ʒ ß. *Ceræ quantum sufficit, fiat unguentum*: These Authors testifie that this will heal any kind of scall. Certainly none can disallow of it, who well considereth the ingredients and composure thereof. *Lib. 1. de comp. med. sect. locet.* *Cap. 8. lib. citat.* The cure. For a scaly scall. An ointment for a scalled head.

A crusty also or fig-like scall may be 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 Hogs fuet. For it will make it fall off in the space of four and twenty hours, besides if it be continued, it will heal them throughly, as I have known by experience, and reason also stands therewith; for according to *Galen*, Cresses are hot and dry. When the crusts shall be fallen away, the parts affected shall be anointed with the formerly prescribed ointment. I have cured many with a little Oyl of Vitriol, and sometimes also with *Ægyptiacum* made somewhat more strong than ordinary. But if the root of the hairs appear rotten, they shall be plucked out one by one; yet if such putrefaction shall possess the whole hairy 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* ʒ vi. *Picis res.* ʒ ii. *Pulv. viridis æris, & vitriol. Rom. an.* ʒ i. *vel* ʒ ß *sulphuris viv.* ʒ ß *coquantur omnia simul in aceti acerrimi quantitate sufficiente, fiat medicamentum ad usum*: Let it be applied to the head and remain on for two days, then let it be quickly and forcibly plucked away against the hair, that so the hairs sticking to the plaster may by that means be plucked away therewith: You shall use this medicine so long as need shall seem to require. The cure for a crusty scall. A poultis of Cresses. *Lib. 7. simp.* A plaster to pluck away the hair at once.

For the third kind of scall which is termed a Corrosive or Ulcerous, the first indication is to cleanse the ulcers with this following ointment. ℞ *Unguenti emulati cum mercurio duplicato, ægyptiaci, an.* ʒ iij. *vitriol. albi in pulverem redacti* ʒ i. *incorporentur simul, fiat unguentum ad usum*; also you may use the formerly described oyntment. But if any other pain or accident fall out, you must withstand it by the assistance and direction of some good Physician; verily these following medicines against all kinds of scalls have been found out by reason, and approved by use. ℞ *Camphor.* ʒ ß. *Alum. rocb. vitriol vir. æris sulph. vivi, fulig. fum. an.* ʒ vi. *Olei amygd. dulcium & axungiæ porci, an.* ʒ ij. *Incorporentur simul in mortario, fiat unguentum*. Some 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 be cured with all these medicines, and that you find his body in some parts thereof troubled, The cure of an ulcerous scall.

troubled in like sort with crusty ulcers, I would wish that his head might be anointed with an ointment made of *Axungia, argentum vivum,* and a little *Sulphur,* and then fit some *emplastrum Vigonis cum mercurio* into the fashion of a cap; also some plaisters of the same may be applied to the shoulders, thighs and legs, and so let him be kept in a very warm chamber, and all things done as if he had the *Lues venerea.* This kind of cure was first (that I know of) attempted by *Simon Blanch* the King's Surgeon, upon a certain young man, when as he in vain had diligently tried all other usual medicines. A scalled head oft-times appeareth very loathsom to the eye, 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 corrupts the temper thereof. Moreover, oft-times being healed, it hath left an *Alopecia* behind it, a great shame to the Surgeons. Which is the reason that most of them judg it best to leave the cure thereof to Empericks and Women.

A contumacious scall must be cured as we cure the *Lues venerea.*

CHAP. III.

Of the Vertigo, *or Giddiness.*

What the *Vertigo* is, and the causes thereof

The *Vertigo* is a sudden darkning of the eyes and sight by a vaporous and hot spirit, which ascendeth to the head by the sleepy arteries, and fills the brain, disturbing the humors and spirits which are contained there, and tossing them unequally, as if one run round, or had drunk too much Wine. This hot spirit oft-times riseth from the heart upwards by the internal sleepy arteries to the *Rete mirabile,* or wonderful net; otherwhiles it is generated in the brain it self, being more hot than is fitting; also it oft-times ariseth from the stomach, spleen, liver, and other entrails being too hot. The sign of this disease is the sudden darkning of the sight, and the closing up, as it were, of the eyes, the body being lightly turned about, or by looking upon wheels running round, or whirl-pits in waters, or by looking down any deep or steep places. If the original of the disease proceed from the brain, the Patients are troubled with the head-ach, heavinesse of the head, and noise in the ears, and oft-times they lose their smell. *Paulus Ægineta* for the cure bids us to open the arteries of the temples. But if the matter of the disease arise from some other place, as from some of the lower entrails, such opening of an artery little availeth. Wherefore then some skilful Physician must be consulted with, who may give directions for Phlebotomy, if the original of the disease proceed from the heat of the entrails; by purging, if occasioned by the foulnesse of the stomach. But if such a *Vertigo* be a critical symptom of some acute disease affecting the *Crisis* by vomit or bleeding, then the whole business of freeing the Patient thereof must be 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 sometimes passeth no higher than the temporal muscles, otherwhiles it reacheth to the top of the crown. The cause of such pain proceedeth either from the veins and external arteries, or from the *Meninges,* or from the very substance of the brain, or from the *Pericranium,* or the hairy scalp covering the *Pericranium,* or lastly, from putrid vapours arising to the head from the ventricle, womb, or other inferior member. Yet an external cause may bring this affect, to wit, the too hot or cold constitution of the encompassing air, drunkennesse, gluttony, the use of hot and vaporous meats, some noisom vapour or smoak, as of Antimony, Quick-silver, or the like, drawn up by the nose, which is the reason that Gold-smiths, and such as gild Metals are commonly troubled with this disease. But whencesoever the cause 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 heavinesse of head argues plenty of humor; pricking, beating, and tension shews that there is a plenty of vapours mixed with the humors, and shut up in the nervous, arterious, or membranous body of the head. If the pain proceed from the inflamed *Meninges,* a Feaver followeth thereon, especially, if the humor causing pain do putrefie. If the pain be superficiary, it is seated in the *Pericranium.* If profound, deep and piercing to the bottom of the eyes, it is an argument that the *Meninges* are affected, and a Feaver ensues, if there be 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 be but with your finger, neither can he away with any noise, or small murmuring, nor light, nor smells however sweet, no nor the fume of Wine. The pain is sometimes continual, otherwhiles by fits. If the cause of the pain proceed from hot, thin and vaporous blood, which will yield to no medicines, a very necessary, profitable and speedy remedy may be had by opening an artery in the temples, whether the disease proceed from the internal or external vessels. For, hence always ensueth an evacution of the conjunct matter, blood and spirits. I have experimented this in many, but especially in the Prince de la *Roche-sur-yon.* His Physicians when he was troubled with this grievous *Megrim,* were *Chaplain,* the Kings, and *Castellane* the Queens chief Physicians, and *Lewes Duret,* who notwithstanding could help him nothing by blood-letting, cupping, bathes, frictions, diet or any other kind of remedy either taken inwardly or applied outwardly. I being called, said, that there was only hope one way to recover his health, which was to open the artery of the temple in the same side that the pain was; for I thought it probable, that the cause of his pain was not contained in the veins, but in the arteries, in which case by the testimony of the Ancients, there was nothing better than the opening or bleeding of an artery,

The differences.

In what kind of *Megrim* the opening of an Artery is good.

A History.

artery, whereof I have made trial upon my self to my great good. When as the Physicians had approved of this my advice, I presently betake my self to the work, and chose out the artery in the pained temple, which was both the more swoln and beat more vehemently than the rest. I open this, as we use to do in the bleeding of a vein, with one incision, and take more than 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 artery is suspected by many, for that it is troublesome to stay the gushing forth blood, and cicatrize the place, by reason of the density, hardness, and continual pulsation of the artery; and lastly, for that when it is cicatrized, there may be danger of an *Aneurisma*. Wherefore they think it better first to divide the skin, then to separate the artery from all the adjacent particles, and then to bind it in two places; and lastly, divide it, as we have formerly told you must be done in *Varices*. But this is the opinion of men who fear all things where there is no cause; for I have learn'd by frequent experience, that the apertion of an artery, which is performed with a Lancet, as we do in opening a vein, is not at all dangerous; and the consolidation or healing is somewhat slower than in a vein, but yet will be done at length, but that no flux of blood will happen, if so be that the ligation be fitly performed, and remain so for four days with fitting pledgets.

No danger in opening an artery.

CHAP. V.

Of certain affects of the Eyes, and first of staying up the upper Eye-lid when it is too lax.

OF the diseases which befal the eyes, some possess the whole substance thereof, as the *Ophthalmia*, a *Phlegmon* thereof: Others are proper and peculiar to some parts thereof, as that which is termed *Gutta serena* to the optick nerve. Whence *Galen* made a threefold difference of the diseases of the eyes, as that some happened to the eye by hurting or offending the chief organ thereof; that is, the crystalline humor; others by hindring the animal faculty, the chief causer of sight, from entring into them; and lastly, other some by offending the parts subservient to the prime organ or instrument. Now of all these diseases, the eye hath some of them common with the other parts of the body, such as are an ulcer, wound, *Phlegmon*, contusion, and the like: Other some are peculiar and proper to the eye, such as are the *Egilops*, *Cataracta*, *Glaucoma*, and divers others of this kind. Some have their upper eye-lid fall down, by reason that the upper skin thereof is relaxed more than is sufficient to cover the eye, the gristle in the mean while not relaxing it self together therewith. Hence proceeds a double trouble; the first, for that the eye cannot be easily opened; the other, because the hairs of the relaxed eye-lid run in towards the eye, and become troublesome thereto by pricking it. The cause 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 watcrish humor, and not acrid or biting; which appears by this, that those who are thus affected have a rank of hairs growing under the natural rank, by reason of abundance 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 cause an itching, and consequently become troublesome to the Patient, and it would also fret in sunder and destroy the roots of the other hairs, so far it is from yielding 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 thereof which is superfluous, and therefore to be cut away, left if you should cut off more than is requisite, the eye-lid should remain turned up, and so cause another kind of affect, which the Ancients have called *Ectropion*. Then the eye being covered, take and lift up with your fingers the middle part of the skin of the eye-lid, not taking hold of the gristle beneath it, and then cut it athwart, taking away just so much as shall be necessary to make it, as it were, natural; lastly, joyn the lips of the wound together with a simple suture of three or four stitches, that so it may be cicatrized; for the cicatrization restrains the eye-lid from falling down so loosly, at least some part thereof being taken away. There ought to be some measure and heed taken in the amputation, otherwise you must necessarily run into the one or other inconvenience, as if too much be cut away, then the eye will not be covered; if too little, then you have done nothing, and the Patient is troubled to no purpose. If there shall be many hairs grown preternaturally, you shall pluck them away with an Instrument made for same purpose; then their roots shall be burned with a gentle cautery, the eye being left untouch'd, for a scar presently arising will hinder them from growing again.

Differences.

Paul. Ægin. l. 6. cap. 6.

The cause.

The cure.

CHAP. VI.

Of Lagophthalmus, *or the Hare-eye.*

SUch as have their eye-lids too short, sleep with their eyes open, for that they cannot be covered by the too short skin of the eye-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 curable, if so that the short eye-lid be of an indifferent thickness. But if it have been from the first conformation, or by some other means, whereby much of the substance is lost, as that which happens by burning, and a carbuncle, then it is uncurable. For the cure, you shall use relaxing and emollient fomentations, then the skin shall be divided above the whole scar, in figure of an Half-moon, with the horns looking downwards. Then the edges of the incision shall be 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 bind up the part with a fitting ligature, that may somewhat press upon the whole eye, left it should lift it self somewhat upwards again, and so return into its ancient, but not natural figure. But in cutting the skin, you

Paulus Ægin. l. 6. cap. 10.

The cure.

must take care that your incision harm not the gristle; for if it be cut, the eye-lid falls down, neither can it be afterwards lifted up. But now for the lower eye-lid: it is subject to sundry diseases, amongst which there is one which answereth in proportion to that, which we late mentioned, which is, when as it is lifted upwards little or nothing, but hangs and gapes, and cannot be joyned with the upper, and therefore it doth not cover the eye, which affect is familiar to old people; it is called *Ectropion*, and it may be helped by means formerly delivered.

Ectropion, or the turning up, or out of the eye-lid.

CHAP. VII.

Of the Chalazion, *or Hail-stone, and the* Hordeolum, *or Barly-corn of the Eye-lids.*

Paul. cap. 6. lib. 6.

THe *Chalazion* is a round and clear pimple, which grows upon the upper eye-lid; it is also moveable, and may be stirred this way and that way with your fingers. The Latins call it *Grando*, for that it resembles a hail-stone. Another pimple not much like this grows sometimes upon the verges of the eye-lids above the place of the hairs. It is termed *Hordeolum*, by reason of the similitude it hath with a barly-corn. The matter of these is contained in its proper cist or skin, and therefore is hardly brought to suppuration. At the first beginning it may be resolved and discussed: But when as it is once grown and concrete into a plaster or stone-like hardness, it is scarce curable. Wherefore it is best to perform the cure by opening them, that so the contained matter may flow or be pressed forth. If the pimple or swelling be small, then thrust it through with a needle and thread, and leave 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 forehead, if it be on the upper eye-lid; or to the cheeks, if on the lower. You must draw through a fresh one every second day, as is usually done in chirurgical setons: For thus at length the swelling will be destroyed, and made plain.

The cure.

CHAP. VIII.

Of the Hydatis, *or fatness of the Eye-lids.*

What *Hydatis* is.

THe *Hydatis* is a certain fatty substance, like a piece of fat, seated and lying under the skin of the upper eye-lid. It is a disease incident to children, who are of a more humid nature: Wherefore it is a soft and loose tumor, making the whole eye-lid, which it possesseth, œdematous; so that as if depressed with a weight, it cannot be lifted up. It hath its name, for that it hath, as it were, a bladder distended with a wheyish humor, which kind of fault is observed by *Galen* in the liver. Those who are thus affected, have their eyes 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 some salt into the place whence it was taken out (unless the vehemency of pain hinder) that so the place may be dried and strengthned, and the rest of the matter (if any such be) may be consumed, and hindred from growing again. Lastly, you shall cover the whole eye with the white of an egg dissolved in Rose-water, or some other repercussive.

Com. ad aphor. 55. sect. 7.

The cure.

CHAP. IX.

Of the Eye-lids fastened or glued together.

Paulus cap. 15. lib. 6.

SOmetimes it cometh to pass that the upper-eye-lid is glued or fastened to the under, so that the eye cannot be opened, or so that the one of them may stick or be fastned to the white coat of the eye, or to the horny. This fault is sometimes drawn from the first original, that is, by the default of the forming faculty in the womb (for thus many Infants are born with their fingers fastned together, with their fundaments, privities and ears unperforated) the eye in all other respects being well composed. The cause of this affect sometimes proceeds 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 horny coat, for otherwise it would fall out. Therefore you must put the end or point of your probe under the eye-lids, and so lifting them up (that you hurt not the substance of the eye) divide them with a crooked Incision-knife.

The cause.

The cure.

The incision made, let the white of an egg beaten with some Rose-water be put into the eye, let the eye-lids be kept open; yea, let the Patient himself be careful that he often turn it upwards, and lift it up with his fingers, not only that the medicine may be 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 some vitriol hath been dissolved, be laid thereon. For thus you shall hinder the eye-lids from joyning together again. Then on the third day the parts or edges of the eye-lids shall be touched with waters drying without biting or acrimony, that so they may be cicatrized. But if the eye-lid adhere to the horny-coat at the *pupilla* or apple of the eye, the Patient will either be quite blind, or very ill of sight. For the scar which ensues will hinder the shapes of things from entring to the crystalline humor, and the vitive 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 be shunned neither by diligence nor industry, but that the eye-lid will always adhere and cleave to the eye.

A disease subject to relapse.

CHAP.

CHAP. X.

Of the itching of the Eye-lids.

MAny have their eye-lids itch vehemently by reason of salt phlegm, which oftentime excoriating and ulcerating the parts themselves, yields a *sanies*, which joyns together the eye-lids in the night time, as if they were glued together, and makes them watry and bleared. This affect doth so torment the Patients, that it oft-times makes them require the Physicians help. Wherefore general medicines being premised, the ulcers shall be washed with the following *Collyrium*; ℞ *Aquæ mellis in balneo mariæ distillatæ* ʒ iij. *Sacchari candi* ʒ i. *Aloes lotæ & in pollinem redactæ* ʒ ß. *Fiat Collyrium.* Which if it do no good, you may use this which follows: ℞ *Ung. Ægyptiac.* ʒ i. *Dissolve in aquæ plantaginis quantitate sufficienti.* Let the ulcerated eye-lids be touched with a soft linnen rag dipped therein, but with care that none thereof fall upon the eye. But when the Patient goes to bed, let him cause them to be anointed with the following ointment, very effectual in this case: ℞ *Axungiæ porci & butyri recentis, an.* ʒ ß. *Tut. præpar.* ʒ ß. *Antimon. in aqua emphrasiæ præparati,* ℈ ij. *Camphoræ gra.* iv. *Misce, & in mortario plumbeo ducantur per tres horas, conflatum inde unguentum, servetur in pyxide plumbea.* Some commend and use certain waters fit to cleanse, dry, bind, strengthen, and absolutely free the eye-lids from itching and redness; of which this is one.

A detergent *Collyrium.*

℞ *Aquæ euphrag. foeniculi, chelidon. an.* ʒ ß. *Sarcocol. nutritæ* ℈ ij. *Vitriol. rom.* ʒ i. *Misceantur simul, & bulliant unica ebullitione; postea colatur liquor, & servetur ad usum dictum.* Or else, ℞ *Aquæ ros. & vini alb. boni an.* ʒ iv. *Tut. præpar. aloes an.* ʒ i. *Flor. æris* ℈ ii. *Camphor. gra.* ij. Let them be boiled according to art, and kept in a glass to wash the eye-lids. Or else, ℞ *vini albi* ℔ ß *salis com.* ʒ i. Let them be put into a clean Barbers bason and covered, and kept there five or six days, and be stirred once a day, and let the eye-lids be touched with this liquor. Some wish that the Patients urine be kept all night in a Barbers bason, and so the Patients eye-lids be washed therewith. Verily in this affect we must not fear the use of acrid medicines, for I once saw a woman of fifty years of age, who washed her eye-lids when they itched, with the sharpest vinegar she could get, and affirmed that she found better success of this than of any other medicine. *Vige* prescribes a water, whose efficacy above other medicines in this affect, he saith, hath been proved; and that it is to be esteemed more worth than gold, the description thereof is thus: ℞ *Aq. ros. vini albi odoriferi mediocris vinositatis, an.* ʒ iv. *Myrobalan. citrini trit.* ʒ i ß. *Thuris* ʒ ij. *Bulliant omnia simul usque ad consumptionem tertiæ partis; deinde immediate addantur flores æris* ℈ ij. *Camph. gr.* ij. Let the liquor be kept in a glass well stopped for the foresaid use.

You need not fear to use acrid medicines in the itching of the eye-lids. *Lib. 2. cap. 9. tract. 3.*

CHAP. XI.

Of Lippitudo, *or Blear-eyes.*

THere are many whose eyes are never dry, but always flow with a thin, acrid, and hot humor which causeth roughness, and upon small occasions, inflammations, blear or blood-shot eyes, and at length also *Strabismus* or squinting. *Lippitudo* is nothing else but a certain white filth flowing from the eyes, which oft-times agglutinates or joyns together the eye-lids. This disease often troubles all the life time, and is to be cured by no remedy; in some it is curable. Such as have this disease from their infancy, are not to be cured, for it remains with them till their dying day. For large heads, and such as are repleat with acrid or much excrementitious phlegm, scarce yield to medicines. There is much difference whether the phlegm flown down by the internal vessels under the skull; or by the external, which are between the skull and the skin, or by both. For if the internal veins cast forth this matter, it will be difficultly cured, if it be cured at all. But if the external vessels cast forth, that cure is not unprofitable, which having used medicines respecting the whole body, applies astringent medicines to the shaved crown, as, *Empl. contra rupturam*, which may straiten the veins, and, as it were, suspend the phlegm, useth cupping, and commands frictions to be made towards the hind-part of the head, and lastly, maketh a seton in the neck. There are some 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 stay the defluxion. For local medicines, a *Collyrium* made with a good quantity of Rose-water, with a little vitriol dissolved therein may serve for all.

What *Lippitudo* is.

A *Collyrium* of vitriol to stay the defluxions of the eyes.

CHAP. XII.

Of the Ophthalmia, *or inflammation of the Eyes.*

AN *Ophthalmia* is an inflammation of the coat *Adnata*, and consequently of the whole eye, being troublesome by the heat, redness, beating, renitency, and lastly pain. It hath its original either by some primitive cause or occasion, as a fall, stroke, dust, or small sand flying into the eyes. For the eye is a smooth part, so that it is easily offended by rough things, as saith *Hippocrates, lib. de Carnibus.* Or by an antecedent cause, as a defluxion falling upon the eyes. The signs follow the nature of the material cause, for from blood especially cholerick and thin, it is full of heat, redness and pain; from the same allayed with phlegm all of them are more remiss. But if a heaviness possess the whole head, the original of the disease proceeds there from. But if a hot pain trouble the forehead, the disease may be thought to proceed from some hot distemper of the *Dura mater*, or the *Pericranium*; but if in the very time of the raging of the disease the Patient vomit, the matter of the disease proceeds from the stomach. But from whencesoever it cometh, there

What *Ophthalmia* is, and the causes thereof.

Signs.

there is scarce that pain of any part of the body, which may be compared to the pain of the inflamed eyes. Verily the greatness of the inflammation hath forced the eyes out of their orb, and broken them asunder in divers. Therefore there is no part of Physick more blazed abroad than for sore eyes. For

The cure. the cure, the Surgeon shall consider and intend three things, diet, the evacuation of the antecedent and conjunct cause, and the overcoming it by topick remedies. The diet shall be moderate, eschewing all things that may fill the head with vapours; 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 be forbidden the use of Wines, unless peradventure the disease may proceed from a gross

Com. ad aphor. 31. sect. 6. and viscid humor, as *Galen* delivers it. The evacuation of the matter flowing into the eye shall be performed by purging medicines, phlebotomy in the arm, cupping the shoulders and neck with scarification, and without: And lastly, by frictions, as the Physician that hath undertaken the cure

Lib. 13. meth. cap. ult. shall think fit. *Galen* after universal remedies for old inflammations of the eyes, commends the opening of the veins and arteries in the forehead and temples, because for the most part the vessels thereabouts distended with acrid, hot, and vaporous blood, cause great and vehement pains in the eye.

For the impugning of the conjunct cause, divers topick medicines shall be applied according to the four sundry times or seasons that every phlegmon usually hath. For in the beginning when as the acrid matter flows down with much violence, repercussives do much conduce; and tempered with resolving medicines, are good also in the increase. ℞ *Aq. ros. & plantag. an.* ʒ ß *mucilag. gum.*

A repercussive medicine. *Tragacanth.* ʒ ij *album. ovi quod sufficit, fiat collyr.* Let it be dropped warm into the eye, and let a double cloth dipped in the same *Collyrium* be put upon it. Or, ℞ *Mucil. sem. pfil. & cydon extracta in aq. plant. an.* ʒ ß. *Aq. solan. & lactis muliebris, an.* ℥ i. *trochisc. alb. rha.* ℈. *Fiat collyrium.* Use

Astringent emplasters. this like the former. The veins of the temples may be straitned by the following medicine. ℞ *Bol. arm. sang. drac. & mast. an.* ʒ ß. *Alb. ovi, aquæ ros. & acet. an.* ʒ i. *Tereb. lot. & ol. cidon. an.* ℥ i. ß, *Fiat defensivum.* You may also use *Ung. de Bolo, empl. diacal.* or *contra rupturam* dissolved in oyl of myrtles, and a little vineger. But if the bitterness of pain be intolerable, the following Cataplasm shall

An anodyne Cataplasm. be applied. ℞ *Medul. pomor. sub cinor. coctorum* ℥ iiij. *Lactis muliebris* ℥ ß; let it be applied to the eye, the formerly prescribed *Collyrium* being first dropped in. Or ℞ *mucilag. sem. pfil. & cidon. an.* ʒ ß *micæ panis albi in lacte infusi,* ʒ ij. *Aquæ ros.* ʒ ß *fiat cataplasma.* The blood of a Turtle Dove, Pigeon, or Hen, drawn by opening a vein under the wings, dropped into the eye, asswageth pain.

The efficacy of Baths in pains of the eyes. Baths are not only anodyne, but also stay the defluxion by diverting the matter thereof by sweats; therefore *Galen* much commends them in such defluxions of the eyes as come by fits. In the state when as the pain is either quite taken away or asswaged, you may use the following medicines. ℞

Ad Aphor. sect. 7. *Sarcocol. in lacte muliebri nutritæ,* ʒ i. *Aloes lotæ in aq. rosar.* ℈ ii. *Trochisc. alb. rha.* ʒ ß *saccharat. cand.* ʒ ij. *Aq. ros.* ʒ iij. *Fiat collyrium.* Or, ℞ *Sem. fœniculi, & fœnug. an.* ʒ ij. *Flo. chamæ. & melil. an.* m. ß. *Coquantur in aq. com. ad* ℥ iij. *colaturæ adde tutiæ præp. & sarcoc. nutritæ in lacte muliebri an.* ʒ i. ß. *Sacchari cand.* ʒ ß. *Fiat collyrium ut artis est.* In the declination the eye shall be fomented with a

Detergent *collyria.* carminative decoction, and then this *Collyrium* dropped thereinto. ℞ *Sarcoc. nutritæ* ʒ ij. *Aloes & myrrh. an.* ʒ i. *Aq. ros. & euphrag. an.* ℥ ij. *Fiat collyrium, ut artis est.*

CHAP. XIII.

Of the Proptosis, *that is, the falling or starting forth of the eye, and of the* Phthisis *and* Chemosis *of the same.*

The cause. THe Greeks call that affect *Proptosis*, the Latines *Procidentia*, or *Exitus oculi* when as the eye stands, and is cast out of the orb, by the occasion of a matter filling and lifting up the eye into a great bigness and largeness of substance. The cause of this disease is sometimes external, as by too violent straining to vomit, by hard labour in child-birth, by excessive and wondrous violent shouting, or crying out. It sometimes happeneth that a great and cruel pain of the head, or the too strait binding of the forehead and temples for the easing thereof, or the palsie of the muscles of the eye, give beginning to this disease. Certainly sometimes the eye is so much distended by the defluxion of humors, that it breaks in sunder, and the humors thereof are shed, and blindness ensues thereof, as I remember befel the sister of *Lewis de Billy* Merchant, dwelling at *Pa-*

The cure. *ris* near St. *Michael's* Bridge. The cure shall be diversified according to the causes. Therefore universal medicines being premised, Cupping-glasses shall be applied to the original of the spinal marrow, and the shoulders; as also Cauteries or Setons: The eye shall be pressed or held down with clothes doubled and steeped in an astringent decoction made of the juice of *Acacia*, Red-roses, the leaves of Poppy, Henbane, Roses and Pomegranate-pills; of which things poultisses may be made by addition of Barly-meal, and the like.

The *Atrophia* of the eye, The *Phthisis* thereof. There is sometimes to be seen in the eye an affect contrary to this, and it is termed *Atrophia*. By this the whole substance of the eye grows lank and decays, and the apple it self becomes much less. But if the consumption and emaciation take hold of the pupil only, the Greeks, by a peculiar name and

Lib. 3. cap. 22. different from the general, term it a *Phthisis*, as *Paulus* teacheth. Contrary causes shall be opposed to each affect; hot and attractive fomentations shall be applied, frictions shall be used in the neighbouring parts, and lastly, all things shall be applied which may without danger be used to attract the blood and spirits into the parts.

The *Chemosis. Paulus l. 3. c. 2.* There is another affect of the eye, of affinity to the *Proptosis*, which by the Greeks is termed *Chemosis*. Now this is nothing else then when both the eye-lids are turned up by a great inflammation, so that they can scarce cover the eyes, and the white of the eye is lifted much higher up than the black. Sometimes the *Adnata* changing 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 variety of the causes, and the condition of the present affect fixed and remaining in the parts, divers remedies shall be appointed.

CHAP.

CHAP. XIV.

Of the Ungula, or Web.

THe *Ungula*, *Pterygion* or Web is the growth of a certain fibrous and membranous flesh upon the upper coat of the eye called *Adnata*, arising more frequently in the bigger, but sometimes in the lesser corner towards the temples. When it is neglected, it covers not only the *Adnata*, but also some portion of the *Cornea*, and coming to the pupil it self hurts the sight therefore. Such a web sometimes adheres not at all to the *Adnata*, but is only stretched over it from the corners of the eye, so that you may thrust a *Probe* between it and the *Adnata*: It is of several colours, somewhiles red, somewhile yellow, somewhiles duskish, and otherwhiles white. It hath its original either from external causes, as a blow, fall, and the like; or from internal, as the defluxion of humors into the eyes. The *Ungula* which is inveterate, and that hath acquired much thickness and breadth, and besides doth difficultly adhere to the *Adnata*, is difficultly taken away; neither may it be helped by medicines whereby scars in the eyes are extenuated. But that which covereth the whole pupil must not be touched by the Surgeon, for being cut away, the scar which is left by its density hindreth the entrance of objects to the crystalline humour, and the egress of the animal spirit to them. But oftentimes it is accompanied with an inflammation of the eyes, a burning, itching, weeping defluxion, and swelling of the eye-lids. That the cure may rightly and happily proceed, he must first use a spare diet, purging medicines shall be given, and blood taken away by opening a vein, especially if there be great inflammation. For peculiar remedies, this excrescence shall be eaten away, or at least kept from growth, by dropping into the eye *Collyrium* of Vitriol described in wounds of the eyes. But if that we profit nothing by this means, it remaineth, that we take it away with the hand after the following manner;

What web curable, and what incurable.

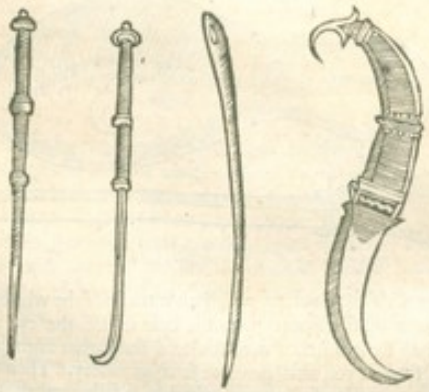
The cure.

You shall set the Patient upon a form or stool, and make him lean much back, and be held so firmly, that he may not fall nor stir, then must you open his sore eye, 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 midst of the web; when you have lifted it a little up, thrust a needle threaded with a smooth thread between it and the *Adnata*, then taking hold of the hook, and the two ends of the thread drawn through with the needle, and lifting up the web by them, you shall gently begin to separate it from the substance of the eye lying thereunder, 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 Figure of little Hooks, a Needle, and crooked Incision-knife.

Little Hooks. *A Needle.* *A crooked Incision-knife.*



Then must it be cut off with a pair of scissers, and the white of an Egg beaten with some Rose-water laid thereon, and often renewed. Afterwards the eye must every day be opened, lest coming to cicatrization, the eye-lids shall be glued together in that part whereas the web is taken away, which also shall be hindred by putting of common Salt, Sage and Cummin-seed into the eye, being first champed and chawed in the mouth. There are some who instead of the crooked Knife separate the web from the *Adnata* with a Horses hair, others do it with a Goose-quill made ready for the same purpose, taking 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 be cut, there will remain a hole, through which during the rest of the life a weeping humor will continually flow; a disease by the Greeks termed *Rhyas*. If after the cutting there be fear of inflammation, linnen rags moistned in repelling medicines, formerly prescribed in wounds of the eye, shall be laid thereupon,

CHAP.

CHAP. XV.

Of the Ægilops, Fistula lacrymosa, *or weeping of the Fistula of the Eye.*

The use of the glandule at the greater corner of the eye. The differences.

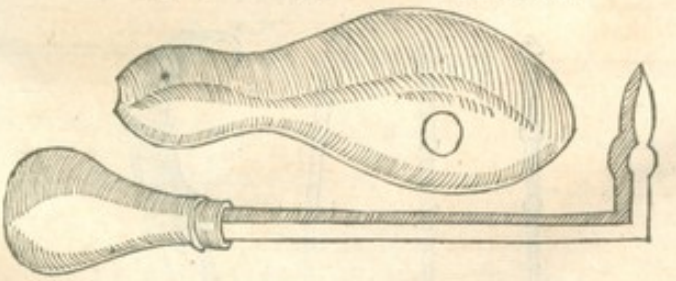
AT the greater corner of the eye there is a glandule, made for the receiving, and containing the moisture which serveth for the lubricating and humecting the eye, lest it should dry by continual motion. This glandule sometimes by a sanguine or pituitous defluxion falling violently from the brain, swells, imposthumates, and ulcerates with an ulcer, not seldom degenerating into a fistula, so that in success of time it rotteth the bone that lieth under it. Of such fistula's, some are open outwardly, and these usually have their original from a phlegmon; othersome 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 only a tumor of the bigness of a pease, this tumor being pressed, floweth with a sanious, serous and red, or otherwise with a white and viscid matter, and that either by the corner of the eye, or by the inside of the nose. Some have this matter flowing continually, others have it only monthly, which is proper also to some fistula's. Such weeping fistula's if they become old, cause an *Atrophia* of the eye, and sometimes blindness and a stinking breath. Therefore we must diligently and speedily by physical and chirurgical means resist the breeding disease. Wherefore, having used general medicines, we must come to particulars. Therefore if the ulcer be not sufficiently wide, it shall be enlarged by putting tents of spunge therein. The flesh of the glandule increasing more than is fit, shall be corrected by putting therein the catheretick powders of Mercury, calcined Vitriol, or some *Aqua fortis*, or oyl of Vitriol; and lastly, by a potential cautery. If you cannot prevail by these means, and that the bone begins to rot, and the Patient be stout hearted, then use an actual cautery whose use is far more effectual, ready, certain and excellent, than a potential cautery, as I have tried in many with happy success. In my opinion it makes no matter, whether the cautery of Gold, Silver or Iron; for the efficacy it hath proceedeth not from the matter, but from the fire. Yet if we must religiously observe and make choice of metals, I had rather have it of Iron, as that which hath a far more drying and astringent faculty than 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 cause to be made a triangular Iron, sharp at the end, that it may the more speedily penetrate. And then the sound eye and adjacent parts being well covered and defended, and the Patients head firmly holden in ones hand, lest the Patient being affrighted, stir himself in the very instant of the operation. But a plate of Iron somewhat depressed in the midst, for the cavity of the greater corner shall be applied and fitted to the pained eye. This plate shall be perforated that the hot Iron may pass thereby to the fistula lying thereunder and so may only touch that which is to be cauterized.

Periodical and typical fistula's.

The cure.

The efficacy of an actual Cautery.

The Figure of a Cautery, and a Plate with a hole therein.



Things to be done after the cauterzing.

After the bone is burnt with the Cautery, a *Collyrium* made of the whites of Eggs beaten in Plantain and Night-shade waters must be poured into the hole it self, the eye and all the neighbouring parts; but the Patient shall be laid in bed with his head somewhat high, and the *Collyrium* shall be renewed as often and as soon as you shall perceive it to grow dry. Then the fall of the Eschar shall be procured by anointing it with fresh Butter; when it is fallen away, the ulcer shall be 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 horny and Grape-like Coat, bred through the occasion of an humor flowing down upon the eye, or by an ulcer, the horny coat, being relaxed, or thrust forth by the violence of the pustule generated beneath. It in shape resembleth a Grape, whence the Greeks stile it *Staphyloma*. This tumor is sometimes blackish, otherwhiles whitish. For if the horny coat be ulcerated and fretted in sunder, so that the grapy 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* be only relaxed and not broken, then the swelling appears of a whitish colour like an unripe Grape. The Ancients have made many kinds or differences thereof. For if it be but a small hole of the broken *Cornea* by which the *Uvea* sheweth or thrusteth forth it self, then they termed it *Mys ophalon*, that is, like the head of a Flie. But if the hole were large, and also callous, they called it

Paulus and Ætius.

Clavus,

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 disease shall happen, it bringeth two discommodities, the one of blindness, the other of deformity. Wherefore here is no place for Surgery to restore the sight, which is already lost, but only to amend the deformity of the eye; which is by cutting off that which is prominent. But you must take heed that you cut away no more than is fit, for so there would be danger of pouring out the humors of the eye. Every *Staphiloma* infers incurable blindness.

CHAP. XVII.

Of the Hypopyon, *that is, the suppurate or putrified eye.*

PUS or Quitture is sometimes gathered between the horny and grapy coat from an internal or external cause: From an internal, as by a great defluxion, and oft-times after an inflammation; but externally by a stroke, through which occasion, a vein being opened hath poured forth blood thither, which may presently be turned into Quitture. For the cure, universal remedies being premised, Cupping-glasses shall be applied, with Scarifications and Frictions used. Anodine and digestive *Collyria* shall be poured from above downwards. *Galen* writes that he hath sometimes evacuated this matter, the *Cornea* being opened at the *Iris*, in which all the coats meet, concur and are terminated. I have done the like, and that with good success, *James Guillemeau* the King's Surgeon being present, the Quitture being expressed and evacuated after the apertion. The ulcer shall be cleansed with *Hydromel*, or some other such like medicine. The cause. *Lib. 14. Method. cap. ult.*

CHAP. XVIII.

Of the Mydriasis, *or dilatation of the Pupil of the Eye.*

Mydriasis is the dilatation of the pupil of the eye, and this happeth either by nature or chance: The former proceedeth from the default of the first conformation, neither is it curable; but the other is of sorts, for it is either from an internal cause, the off-spring of an humour flowing down from the brain, wherefore physical means must be used for the cure thereof. Now that which cometh by any external occasion, as a blow, fall or contusion upon the eye, must be cured by presently applying repercussive and anodyne medicines, the defluxion must be hindred by diet skilfully appointed, phlebotomy, cupping, scarification, frictions, and other remedies which may seem convenient. Then must you come to resolving medicines, as the blood of a Turtle-dove, Pigeon or Chicken, reeking-hot out of the vein, being poured upon the eye and the neighbouring parts. Then this following Cataplasm shall be applied thereto, ℞ *Farinæ fabar. & hordei an.* ℥ iij. *Ol. rosar. & myrtillor. an.* ℥ i. ß *pul. ireos flor.* ℥ ij. *Cum sapa fiat cataplasm.* You may also use the following fomentation: ℞ *Rosar. rub. & myrtil. an.* m. i *florum melil. & chamæm. an.* p. i. *Nucum cupress.* ℥ i. *Vini austeri* lb ß. *Aq. rosar. & plantag. an.* ℥ iii. Make a decoction of them all for a Fomentation to be used with a sponge. The cause. 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 else but the concretion of an humor into a certain thin skin under the horny coat, just against the apple or pupil, and as, it were swimming upon the watery humor; and whereas the place ought to be empty, opposing it self to the internal faculty of seeing, whereby it differeth from spots and scars growing upon the horny coat and *Adnata*. It sometimes covereth the whole pupil, otherwhiles but the one half thereof, and somewhiles but a small portion thereof. According to this variety the sight is either quite lost, weak, or somewhat depraved, because the animal vitive spirit cannot in its entire substance pass through the density thereof. The defluxion of the humor whence it proceeds, is either caused by an external occasion, as a stroke, fall, or by the heat or coldness of the encompassing air, troublesome both to the head and eyes; or else it is by an internal means, as the multitude, or else the acrid hot and thin quality of the humors. This disease also sometimes taketh its original from gross and fumid humors sent from a crude stomach, or from vaporous meats or drinks, up to the brain, and so it falleth into the eyes, where, by the coldness, straitness, and tarrying in the place, they turn into moisture, and at length into that concretion or film which we see: The signs may be easily drawn from that we have already delivered. For when the Cataract is formed and ripe, it resembleth a certain thin membrane spred over the pupil, and appeareth of a different colour, according to the variety of the humor whereof it consisteth, one while white, another while black, blue, ash-coloured, livid, citrine green. It sometimes resembleth Quick-silver, which is very trembling and fugitive, more than the rest. At the first when it beginneth to breed, they seem to see many things, as Flies flying up and down, Hares, Nets, and the like, as if they were carelesly tossed up and down before their eyes: Sometimes every thing appeareth two, and some whiles less than they are, because the vitive spirit is hindred from passing to the objects by the density 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 vitive 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 midst thereof be covered, and, as it were, the centre of the crystalline humor, A Cataract. The differences. Causes. Signs.

humor, then they seem as if they had holes or windows: But if it cover it all, then can he see nothing at all, but only 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 Beginning Cataract is hindred 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 yield a phlegmatick juice and vaporous; as, Pease, Beans, Turneps, chesnuts, and lastly, all such things as have the faculty of stirring up the humors, and causing defluxion in the body, such as are all salt, and spiced meats, as also garlike, onions, mustard. The immoderate use of venery hurts more than all the rest, for that it more violently exagitates the whole body, weakens the brain and head, and begets crude humors. Let his bread be seasoned with some Fennel-seeds, for it is thought to have a faculty of helping the sight, and clearing the eyes, and dissipating the misty vapours in the stomach before they can ascend to the brain. Wherefore by the same reason it is good to use Marmelade of Quinces, Conserve of Roses, and common Dridge-powder, or any such like composed of things good to break wind, or corroborate the ventricle. Phlebotomy and purging, if they be requisite, shall be fitly appointed: Ventoses shall be applied to the shoulders and neck; and phlegmatick matter shall be diverted and evacuated by the mouth with using masticatories in the morning. There be some which believe, that a beginning Cataract may be dissipated and discussed by often rubbing the eye-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 believe, that by beams plentifully and suddenly brought and diffused over the eye, directly opposite against some bright shining thing, it may seem to have a penetrating, dividing, dissolving, as also a consuming and drying faculty. Besides, also the hot breath of him who holdeth in his mouth, and chaweth Fennel-seeds, Annis-seeds, Coriander-seeds, Nutmeg, Cinnamon, Cloves, and the like, hath a great faculty, the eyes being first gently rubbed with the finger, it being breathed in near at hand, and often received, to heat, attenuate, resolve, digest and diffuse the humor which is ready to concrete. Moreover, this *Colyrium* of *John Vigo* is thought very powerful to clear the eyes, strengthen the sight, hinder suffusions, and discuss them, if at any time they concrete, and begin to gather. ℞ *Hepatis hirci sani & recentis* ℔ ij *calami aromatici & mellis an.* ℥ ℔. *Succi rutæ,* ʒ iij. *Aquæ chelidoniæ, fœniculi, verbenæ, euphrasiæ an.* ʒ iij. *Piperis longi, nucis moschatæ, caryophyllorum an.* ʒ ij. *Croci* ℈ i. *floris rorismarini aliquantum contriti,* m. ℔. *Sarcocollæ, aloes hepaticæ, an.* ʒ iij. *Fellis vitæ, leporis & perdicis. an.* ʒ i. *terantur omnia, tritisq; adde sacchari albi* ℥ ij. *mellis rosati* ʒ vi. *conjiciantur in alembicum vitreum, & destillentur in balneo Mariæ:* Let this distilled liquor be often dropped into the eyes. But if you prevail nothing by all these medicines, and that the cloudy and heaped-up humor doth daily increase and thicken, then must you abstain from remedies, and expect until it be no more heaped up, but thickned, yea until it seem to be grown somewhat hard: For so it may be couched with a needle; otherwise if this same skin shall not be ripe, but more tender than is fitting, when you shall come to the operation, it will be broken and thrust through with the needle, and not couched. On the contrary, if it be too hard hard, it will resist the needle, neither will it suffer it self to be easily couched. Wherefore it is requisite that the Surgeon know when it is ripe, and he must diligently observe the signs whereby he may discern a ripe Cataract from an unripe; and that which is curable, from that which is uncurable. For that only which is ripe and curable, is to be 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 dense, and lastly, that which is uncurable must not be attempted at all.

How bright shining things may dissipate a beginning Cataract.

A *collyrium* dissipating a beginning Cataract.

A Cataract must not be couched, unless it be ripe.

CHAP. XXI.

By what signs ripe and curable Cataracts may be discerned from unripe and uncurable ones.

Uncurable Cataracts.

IF the sound eye being shut, the pupil of the sore or suffused eye, after it shall be rubbed with your thumb, be presently dilated and diffused, and with the like celerity return into the place, figure, colour and state, it is thought by some to shew a ripe and confirmed Cataract. But an unripe, and not to be couched, if the pupil remain dilated and suffused for a long while after. But it is a common sign of a ripe, as also more dense, and consequently uncurable suffusion, to be 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 eye being shut and prested, the pupil of the other rubbed with your thumb, is dilated, enlarged, swelleth, and is more diffused; the visive spirits by this compression being, as it were, forced from the sound into the sore-eye. But these following Cataracts are judged uncurable, that is, such as are great, such as when the eye-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 nerve, so that how cunningly and well soever the Cataract be couched, yet will the Patient continue blind; you shall do no more good in couching a Cataract, which is in an eye consumed and wasted with a *Phthisis*. Also that Cataract is incurable, which is occationed 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 plaster-like green, black, livid, citrine and quick-silver-like colour, are usually uncurable. On the contrary, such as are of a Chestnut colour, or of a sky or sea-water colour, with some little whiteness, yield great hope of a happy and successful cure.

Curable Cataracts.

CHAP.

CHAP. XXII.

Of the couching a Cataract.

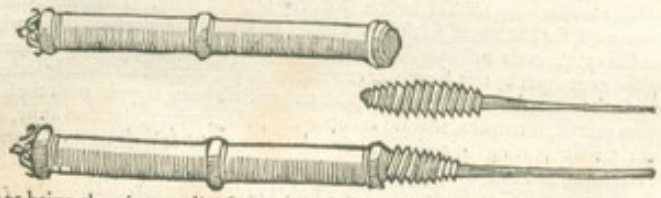
AFter you shall know by the fore-mentioned signs that the Cataract is curable, it remains that you attempt the couching thereof, but so, that there be nothing which may hinder. For if the pain of the head, cough, nauseousness or vomiting at that time trouble the Patient, you shall then bestow your labour in vain: wherefore you must expect till these symptoms are gone. Then make choice of a season fitting for that purpose, that is, in the decrease of the Moon, when the Air is not troubled with Thunder nor Lightning, and when as the Sun is not in *Aries*, because that sign hath dominion over the head. Then let the Surgeon consult a Physician whether purging or bloud-letting be convenient for the Patient, so to resist plethorick symptoms, otherwise ready to yield matter for relapse. Two days after you must make choice of a place furnished with indifferent or competent light, and the Patient being fasting shall be placed in a straight Chair, so that the light may not fall with the beams directly upon him, but side-wise. The eye which shall be cured, must be made more steddy by laying and binding Wool upon the other. Then the Surgeon shall seat and place himself directly against the Patient upon a seat somewhat higher, and bidding the Patient put his hands down to his girdle, he shall hold the Patients legs between his knees. One shall stand at the Patients back, who shall hold his head, and keep it from stirring; for by a little stirring he may lose his sight for ever. Then must you prepare and make ready your Needle, and thrust it often into some strong thick cloth, that it may be as it were smooth by this motion, and for the performance of the work in hand with the less pain somewhat warmed. It must be made of iron, or steel, and not of gold or silver, it must be also flatted on the sides, and sharp-pointed, that so it may the better pierce into the eye, and wholly couch the Cataract once taken hold of; and lest it should slip in the Surgeons hand, and be less steddy, it shall be put into a handle, as you may see by this Figure.

When to couch a Cataract.

The place.

The Needle.

A Needle inserted in a handle for the couching of Cataracts.



All things being thus in a readiness, you must bid the Patient to turn the sight of his eye towards his nose, and the Needle must be boldly thrust (for it is received in a place that is void, and onely filled with spirits) directly by the coat *Adnata*, in the middle space between the lesser corner and the horny coat, just against the midst 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 come to the midst of the pupil and suffusion. When it is come thither, the Needle must be inclined from above downwards to the suffusion, and there to be stirred gently until by little and little it couch or bring down the Cataract as whole as may be beneath the compass of the pupil; let him still follow it though couched with his Needle, and somewhat violently depress and keep it down for some short space, that so it may rest and stay in that lower place whither it is depressed. The Surgeon shall try whether it firmly remain there or no, bidding the Patient presently to move his eye; for if it remain constantly so, and do not return again, the Cure is perfect. Then must the Needle be lifted up by little and little, neither must it presently be taken forth, that if the Cataract should bear up, or rise again, that it might again, and so often (whilest the work is yet hot, and all things in a readiness) be couched towards the lesser corner, until it be 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 chrystalline humour, the prime instrument of sight, or the pupil with danger of dilating thereof. Some as soon as the work is done, give the Patient something in his hand to look upon: but *Paulus* approves not thereof, for he fears lest his endeavoring or striving to see, may draw back the Cataract. Wherefore it is more wisdom, 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 apply it to the eye and neighbouring parts for to bind and hinder the inflammation; then also you must together therewith bind up the sound eye, lest by stirring to see, it might together therewith draw and move the sore eye, by reason of the sympathy and consent they mutually have by the optick nerves. After all things are thus performed, the Patient shall be laid in a soft bed, and so placed, that his head may lie somewhat high; let him be laid far from noise, let him not speak, nor eat any hard thing that may trouble his jaws, wherefore let him feed upon liquid meats, as panado, barley-cream, cullisses, gellies, rear-eggs, and other meats of the like nature. At the end of eight days the ligature that binds up the eyes shall be loosed, and his eyes washed with Rose-water, and putting on Spectacles, or some Taffaty, the Patient shall by little and little accustom himself to the light, lest he should be offended by the sudden meeting with light. But if the suffusion, after some short while after lift it self up again, it must be couched again, but through a new hole, for the eye is pained and tender in the former place. It sometimes happens by the touch of the Needle that the Cataract is not couched whole, but is broken into many pieces; then therefore each of them must be followed, and couched severally: if there be any very small particle which scapes

Gal.lib.10. de usu partium c.5. Celsus lib.7.

The sign of a Cataract well couched.

Lib.6.cap.11.

What to be done after the couching of a Cataract.

Of a Cataract which is broken to pieces.

the needle, it must be let alone, for there is no doubt but that in process of time it may be dissolved by the force of the native heat. There are also some Cataracts which at the first touch of the needle are diffused and turn into a substance like to Milk or troubled Water, for that they are not throughly ripe, yet these put us in good hope of recovery, if it be but for this, that they can never afterwards concrete into one body as before. Wherefore at the length they are also discussed by the strength of the native heat, and then the eye recovers its former splendor. If that any other symptoms come unlooked for, they shall be helped by new counsels and remedies.

CHAP. XXIII.

Of the stopping of the passage of the Ears, and the falling of things thereinto.

The Cause.

IT sometimes happeneth that children are born without any 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 being ulcerated by some impostume or wound, and the ear shut up by some fleshly excrescence or scar. When as the stopping is in the bottom of the cavity, the cure is more difficult than if it were in the first entrance. But there is a double way of cure; for this substance, whatsoever it be, must either be cut out, or else eaten away and consumed by acrid and catheretick Medicins; in performance of which there is need of great moderation of the mind and hand. For it is a part endued with most exquisite sense and near the brain, wherefore by handling it too roughly, there is fear of distension of the nerves, and consequently of death.

The Cure.

Sometimes also the preternatural falling of some 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, Cherry-stones, or Kernels, Pease and other such like Pulse. Now solid and bony bodies still retain the same magnitude; but Pease Seeds and Kernels, by drawing the moisture there implanted into them, swell up, and cause vehement pain by the distension of the neighbouring parts, wherefore the sooner they are drawn forth, the better it is for the Patient. This shall be done 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 bullets shot deep into the body. Little stones and bodies of the like stony hardness, shall be forced forth by the brain, provoked to concussion by sneezing, and by dropping some Oil of Almonds first into the passage of the Ear, that the way may be the more slippery; for it will come to pass by this sneezing, or violence of the internal air forcibly seeking passage out, that at length they may be cast forth, the mouth and nostrils being stopped with the hand. But if we cannot thus prevail, it remains, that we cut open the passage with an incision knife, so much as shall be sufficient for the putting in and using of an Instrument to extract them. If any creeping things of little creatures, as Fleas, Ticks, Pismires, Gnats, and the like, which sometimes 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* (we an Earwig,) this if it chance to get into the Ear, may be killed by the fore-said 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 sneezing.

CHAP. XXIV.

Of getting of little bones and such like things out of the Jaws and Throat.

The Cure different according to the places where they stick.

SOmetimes little bones and such like things in eating greedily use to stick, or as it were fasten themselves in the Jaws or Throat. Such bodies if you can come to the sight of them, shall be taken out with long, slender and crooked Mallets made like a Cranes beak. If they do not appear, nor there be no means to take them forth, they shall be cast forth by causing vomit, or with swallowing a crust of bread, or a dry fig gently chawed, and so swallowed; or else they shall be thrust down into the stomach, or plucked back with a leek, or some other such long and stiff crooked body anointed with Oil and thrust down the throat. If any such like thing shall get into the Weazon, you must cause coughing, by taking sharp things, or else sneezing; so to cast forth whatsoever is there troublesom.

CHAP. XXV.

Of the Tooth-ach.

The Tooth-ach a most cruel pain.

OF all pain, there is none which more cruelly tormenteth the Patients than the Tooth-ach. For we see them often-times after the manner of other bones to suffer inflammation, which will quickly suppurate, and they become rotten, and at length fall away piece-meal; for we see them by daily experience to be eaten and hollowed, and to breed Worms, some portion of them putrefying. The cause of such pain is either internal, or external and primitive. The internal is a hot or cold defluxion of humours upon them, filling their sockets, and thence consequently driving out the teeth; which is the reason that they stand sometimes so far forth, that the Patient neither dares, nor can make use of them to chaw for fear of pain; for that they are loose 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 any 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 some ease by

The cause thereof. The signs of this or that defluxion.

by the use of cold things: Now the signs of a cold defluxion are a great heaviness of the head, much and frequent spitting, some mitigation by the use of hot remedies. In the bitterness of pain we must not presently run to Tooth-drawers, or cause them presently to go in hand to pluck them out. First consult a Physician, who may prescribe remedies according to the variety of the causes. Now here are three intentions of Curing. The first is concerning Diet, the other for the evacuation of the defluxion or antecedent cause, the third for the application of proper remedies for the asswaging of pain. The two former scopes, to wit, of Diet, and diverting the defluxion by Purging, Phlebotomy, application of Cupping-glasses to the Neck and Shoulders, and Scarification, do absolutely belong to the Physician. Now, for proper and topick Medicins they shall be chosen contrary to the cause. Wherefore in a hot cause it is good washing the mouth with the juice of Pomgranates, Plantain Water, a little Vinegar, wherein Roses, *Balaustiæ* and *Sumach* have been boiled. But such things as shall be applied for the mitigating of the pain of the Teeth, ought to be things of very subtle parts, for that the Teeth are parts of dense consistence. Therefore the Ancients have always mixed Vinegar in such kind of remedies. ℞ *Rosar. rub. sumach. hordei, an.* m. ß. *seminis hyoscyami conquassati,* ʒ ij. *santalorum an.* ʒ j. *latitiæ summitatum rubi, solani, plantaginis, an.* m. ß. *buliant omnia in aquæ* lb iv. *& pauco aceto ad hordei crepaturam.* Wash the mouth with such a decoction being warm. You may also make Trochisces for the same purpose after this manner. ℞. *Sem. hyoscyami, sandarachæ, coriandri, opii, an.* ʒ ß. *terantur & cum aceto incorporentur, formenturque trochisci apponendi dentibus dolentibus.* Or else, ℞ *Sem. portulacæ, hyoscyami, coriandri, lentium, corticis, santali citrini, rosar. rub. pyrethri, camphoræ, an.* ʒ ß. let them all be beaten together with strong Vinegar, and made into Trochisces, with which being dissolved in Rose-water, let the Gums and whole mouth be washed when need requireth. But if the pain be not asswaged with these, you shall come to narcoticks which may stupefie the nerve; as, ℞. *Sem. hyoscyami albi, opii camphoræ, papav. albi, an. quantum sufficit, coquantur cum sapa, & denti applicentur.* Besides you must also put this following Medicin into the ear of the pained side. ℞ *Opii & castorei, an.* ℈ j. *misceantur cum oleo rosato:* It hath sometimes availed in swollen and distended Gums, being first lightly scarified, 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 behind the ears. For I remember that I, by these three kinds of remedies, asswaged great pains of the Teeth. Yet there be some who in this affect open not these veins which are behind the ears, but those which are conspicuous in the hole of the ear, in the upper part thereof.

Three scopes of curing.

A cold and repercussive lotion for the mouth.

Trochisces for a hot defluxion.

Narcoticks.

Pain of the Teeth arising from a cold cause and defluxion, may be helped by these remedies; boil Rosemary, Sage, and Pellitory of *Spain* in Wine and Vinegar, and add thereto a little *aqua vitæ*; in this liquor dissolve a little treacle, and wash your Teeth therewith. Others mingle Gum *ammoniac* dissolved in *aqua vitæ* with a little *sandarachæ* and myrrh, and lay it to the pained Tooth after *Vigo*'s counsel. *Mesue* thinks that beaten Garlick carried in the right or left hand, asswages the pain, as the Teeth ake upon the right or left side. But I being once troubled with grievous pain in this kind, followed the counsel of a certain old Woman, and laid Garlick roasted under the embers to my pained tooth, and the pain forthwith ceased. The same remedy used to others troubled with the like affect, had like success. Moreover, some think it available if it be put into the auditory passage. Others drop into the ears Oil of *Castoreum*, or of Cloves, or some such other Chymical Oil. It is good also to wash the Teeth with the following decoction. ℞ *Rad. pyrethri* ʒ ß. *menthæ & rutæ, an.* p. j. *buliant in aceto,* and with this decoction being warm, wash the Teeth. Some like fumes better, and they make them of the Seeds of *Colocynthida* and mustard, and other like; they take the smoak by holding their mouths over a Funnel. Other some boil Pellitory of *Spain*, Ginger, Cinnamon, Alum, common Salt, Nutmegs, Cypress-nuts, Anise and Mustard Seeds, and *Euphorbium* in Oxycrate, and in the end of the decoction add a little *aqua vitæ*, and receive the vapour 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. Some there are which affirm, that to wash the Teeth with a decoction of Spurge is a very good and anodyne Medicin in the Tooth-ach. I have oft-times asswaged intolerable pains of the Teeth, by applying vesicatories under the ear, to wit, in that cavity whereas the lower jaw is articulated with the upper; for the vein, artery, and sinew that are distributed to the roots of the Teeth, lie thereunder. Wherefore the blisters being opened, a thin liquor runs out, which doth not only cause, but also nourish or feed the disease. But if the tooth be hollowed, and that the Patient will not have it pulled out, there is no speedier remedy than to put in caustick medicins, as oil of vitriol, *aqua fortis*, and also an hot iron; for thus the nerve is burnt in sunder, and loseth its sense. Yet some affirm that the milky juice that flows from Spurge made into a paste with *olibanum* and *amylum*, and put into the hollow tooth, will make it presently to fall away in pieces. When the gums and cheeks are swollen with a manifest tumor, then the Patient begins to be somewhat better and more at ease. 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 be, it is convenient to intercept the course thereof with *Empl. contra rupturam* made with Pitch and Mastich, and applied to the temple on that side where the tooth aketh.

Hot Fumes.

Vesicatories.

Caustick.

CHAP. XXVI.

Of other Affects of the Teeth.

THe Teeth are also troubled with other preternatural affects. For sometimes they shake by relaxation of the Gums, or else become corrupt and rotten, or have Worms in them, or else are set on edge. For the first, the Gums are relaxed either by an external or primitive cause, as a Fall or Blow: or else by an internal or antecedent, as by the defluxion of acrid or watrish humours from the brain, or through want of nourishment in old bodies. If the Teeth grow loose by the means of the decaying Gums, the disease is then uncurable: but you

Causes of looseness of the Teeth.

you may withſtand the other cauſes by the uſe of ſuch things as faſten the teeth, ſhunning on the contrary ſuch as may looſen them. Therefore the Patient muſt not ſpeak too earneſtly, neither chew hard things. If they become looſe by a fall or blow, they muſt not be taken forth, but reſtored and faſtned to the next that remain firm, for in time they will be confirmed in their ſockets, as I tried in *Antony de la Rue* a Tailor, who had his Jaw broken with the Pommel of a Dagger, and three of his teeth were looſened, and almoſt ſhaken out of their ſockets; the Jaw being 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 Alum boiled 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 he within a while after could chew as eaſily upon thoſe teeth as upon the other. I heard it reported by a credible perſon, that he ſaw a Lady of the prime Nobility, who in ſtead of a rotten tooth ſhe drew, made a ſound tooth, drawn from one of her waiting Maids at the ſame time, to be ſubſtituted and inſerted, which tooth in proceſs of time, as it were taking root, grew ſo firm, that ſhe could chew upon it as well as upon any of the reſt. But as I formerly ſaid, I have this but by hear-ſay.

A Hiſtory.

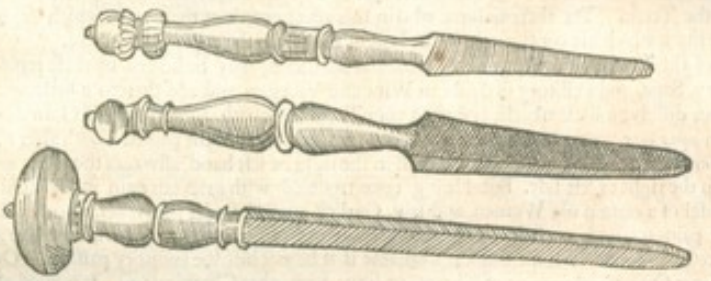
The cauſes of hollow teeth.

Now the teeth are corroded or eaten in by an atrid and thin humour penetrating by a plenteous and frequent defluxion even to their roots, and being there contained, it putrefies, and becoming more acrid, it doth not onely draw the teeth into the contagion of its putrefaction, but alſo perforates and corrodes them.

The Cure.

The putrefaction may be corrected, if after general Medicins 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 being red hot: you ſhall thruſt this hot iron thorow a Pipe or Cane made for the ſame purpoſe, leſt it ſhould harm any ſound part by the touch thereof, and thus the putrefaction, the cauſe of the arroſion may be ſtaid. But if the hole be on the one ſide between two teeth, then ſhall you file away ſo much of the ſound tooth, as that you may have ſufficient liberty to thruſt in your Wier without doing any harm.

The forms of Files made for filing the Teeth.



Cauſes of Worms in the teeth.

Worms breeding by putrefaction in the roots of the teeth, ſhall be killed by the uſe of cauſticks by gargles or lotions made of Vinegar, wherein either Pellitory of *Spain* hath been ſteeped, or treacle diſſolved; alſo aloes and garlick are good to be uſed for this purpoſe.

Cauſes of ſetting the teeth on edge.

Setting the teeth on edge happens to them by the immoderate eating of acrid or tart things, or by the continual aſcent of vapours endued with the ſame quality, 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 ſtupefying liquors. This affect is taken away, if after general Medicins and ſhunning thoſe things that cheriſh the diſeaſe, the teeth be often waſhed with *aqua vitæ*, or good Wine wherein Sage, Roſemary, Cloves, Nutmegs, and other things of the like nature have been boiled.

CHAP. XXVII.

Of drawing of Teeth.

TEeth are drawn, either for that they cauſe intolerable pains, which will not yield to Medicins, or elſe for that they are rotten and hollowed, ſo that they cauſe the breath to ſmell; or elſe for that they infect the ſound and whole teeth, and draw them into the like corruption, or becauſe they ſtand out of order. Beſides, when they are too deep and ſtrongly rooted, ſo that they cannot be plucked out, they muſt oft-times be broken of neceſſity, that ſo you may drop ſome cauſtick thing into their roots, which may take away the ſenſe, and conſequently the pain. The hand muſt be uſed with much moderation in the drawing out of a tooth; for the jaw is ſometimes diſlocated by the too violent drawing out of the lower teeth. But the temples, eyes, and brain are ſhaken with great danger by the too rude drawing of the upper teeth. Wherefore they muſt firſt be cut about, that the Gums may be looſed from them, then ſhake them with your fingers, and do this until they begin to be looſe; for a tooth which is faſt in, and plucked out with one pull, oft-times breaks the jaw, and brings forth the piece together therewith, whence follows a Fever and a great flux of bloud not eaſily to be ſtaid (for bloud or *pus* flowing out in great plenty is, in *Celſus*'s opinion, the ſign of a broken bone) and many other malign and deadly ſymptoms. Some have had their mouths drawn ſo awry, during the reſt of their lives, that they could ſcarce gape. Beſides, if the tooth be much eaten, the hole thereof muſt be filled either with Lint, or a Cork, or a piece of Lead well fitted thereto, leſt it be broken under your *forceps*, when

A caveat in drawing of teeth.

Lib. 7. cap. 8.

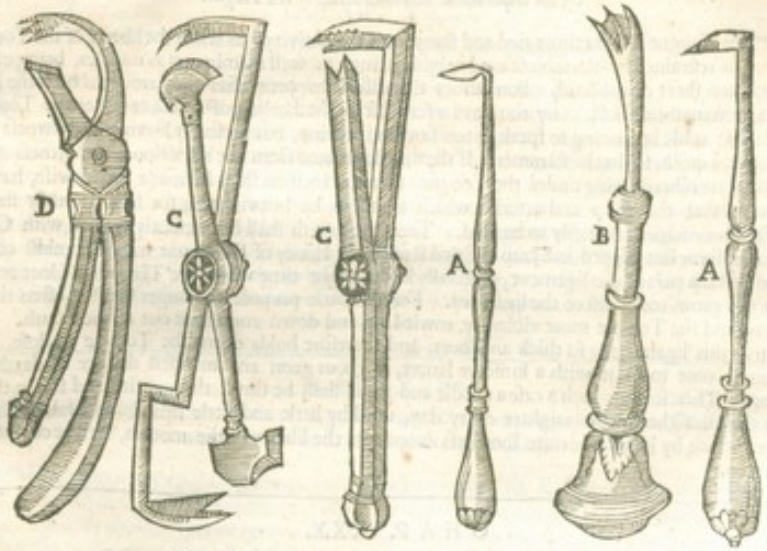
it

it is twitched more straightly to be plucked out, and the root remain, ready in a short time to cause more grievous pain. But judgment must be used, and you must take special care, lest you take a sound tooth for a pained one; for oft-times the Patient cannot tell, for that the bitterness of pain by neighbourhood 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 be placed in a low seat, bending back his head between the Tooth-drawers legs; then the Tooth-drawer shall deeply scarifie about the tooth, separating the gums therefrom with the instruments marked with this letter *A*, and then if spoiled as it were of the wall of the gums, it grow loose, it must be shaken and thrust out, by forcing it with the three-pointed Levatory noted with this Letter *B*; but if it stick in too fast, and will not stir at all, then must the tooth be taken hold of with some of these toothed *forcipes* marked with these letters *C C D*; 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, he can scarce so carry himself, but that he will force out three teeth at once, oft-times leaving that untoucht which caused the pain.

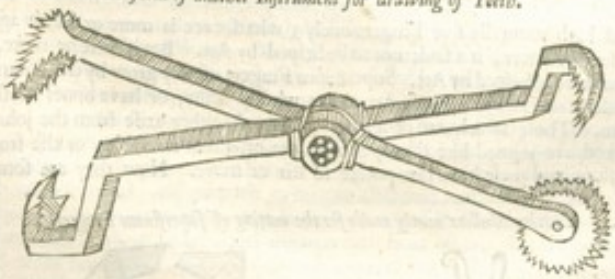
The manner of drawing Teeth.

The Effigies of Forcipes, *or Mullets for the drawing of Teeth.*

Instruments for scraping the Teeth and a three-pointed Levatory.



The form of another Instrument for drawing of Teeth.



After the Tooth is drawn, let the blood flow freely, that so the part may be freed 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 he took out the Tooth, that so the socket that was too much dilated, and oft-times torn by the violence of the pluck, may be closed again. Lastly, The mouth shall be washed with Oxycrate; and if the weather be cold, the Patient shall take heed of going much in the open air, lest it cause a new defluxion upon his Teeth.

What to be done when the Tooth is pluckt out.

CHAP. XIV.

Of cleansing the Teeth.

Pieces of meat in eating sometimes stick between the teeth, and becoming corrupt by long staying there, do also hurt the teeth themselves, and spoil the sweetness of the breath. He that would eschew this, ought presently after meat, to wash his mouth with Wine mixed with Water, or Oxycrate, and well to cleanse his teeth, that no slimy matter adhere to them. Many folks teeth by their own default gather an earthy filth of a yellowish colour, which eats into them by little and little, as rust eats into iron. This rusty filthiness, or as it were mouldiness of the teeth, doth also oft-times grow by the omitting of their proper duty, that is of chawing. Whence-

Causes of foul or rusty Teeth.

The Cure.

A caution in the use of acrid things.

foever this slimy filth proceeds, we must get *Dentifrices* to fetch it off withall, and then the teeth must be presently rubbed with *aquâ fortis* and *aquæ vitæ* mixed together, that if there be any thing that hath scaped the *Dentifrices*, it may be 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.

Dentifrices shall be made of the root of Marsh-mallows boiled in white Wine and Allum, and, as when the teeth are loose, we must abstain from such things as are hard, to be eaten and chewed, but much more from breaking of such things as are of a bony consistence, so also here we must shun all things that by their toughness stick to the teeth. Many for the cleansing of the teeth commend a Powder made of Scuttle-bones, Purple-shells, Pumice-stone, burnt Allum, and Harts horn, and a little Cinnamon, which is a singular remedy for the teeth howsoever affected. Many other are content with bread only tosted and beaten; but this following Water is very effectual to whiten the teeth.

A Water to whiten the teeth.

℞ *Sal. ammon. & gemmei, an.* ʒ j. *alum. roch.* ʒ ß. *aquæ ros. quod sufficit, distillentur.* And let the teeth be cleansed with this distilled liquor.

CHAP. XXIX.

Of the impediment and contraction of the Tongue.

The cause of being Tongue-tied.

THe Tongue is sometimes tied and short from the nativity, as when the liberty of the Tongue is restrained by the subject and neighbouring, as well membranes as muscles, being either too short or too hard. Sometimes this disease happens after they are born by some accident or preternatural affect, as by too hard a scar left by the healing of an Ulcer under the Tongue. The Patient at his beginning to speak, is too slow in speaking, but presently leaving his slowness, he becomes too quick, so that he stammers.

The Cure.

If the disease proceed from the astriction and shortness of the ligamental membrane lying under the Tongue, then the incision shall be made broad-wise, having great care that the veins and arteries which are there, be not violated, for fear lest they should cause an *Hemorrhagie*, not easily to be staid. Then the mouth shall be presently washed with Oxycrate, and some lint dipped in Syrup of dried Roses, or Honey of Roses put into the midst of the incision, lest the part of the ligament, especially in 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 be often thrust this way, and the Tongue more violently rowled up and down and thrust out of the mouth. Yet sometimes this ligament is so thick and short, and therefore holds down the Tongue so close, that you cannot come to cut it with a knife or lancet, without great and manifest danger of death by bleeding.

Another way to cure it.

Therefore in such a case a needle and thred shall be thrust through it, and so the thred shall be tied straighter and straighter every day, until by little and little this ligamental tie of the Tongue, which by its immoderate shortness intercepts the liberty of the motion, shall be consumed and broken.

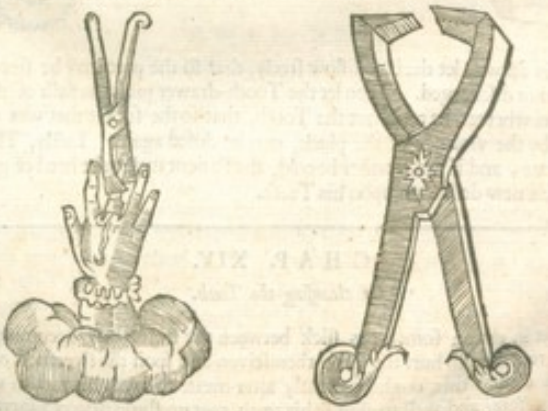
CHAP. XXX.

Of superfluous Fingers, and such as stick together.

The differences.

EAch hand hath naturally five Fingers onely; whatsoever is more or less is against Nature: and if there be fewer, it a fault not to be helped by Art. But if there be more, that for the most part maybe helped by Art. Superfluous Fingers usually grow by the Thumb or the little Finger, but seldom otherwise. These are either wholly fleshy, or have bones of their kind and nails upon them. Those which are of a bony nature, do either arise from the joints of the natural Fingers, and are jointed like them, and so are oft-times movable; or else from some middle space of a joint, and these have not power to stir or move. Now they are sometimes equal

Cutting Mullets neatly made for the cutting off superfluous Fingers.



in magnitude to the natural Fingers to which they grow, yet more frequently they are shorter. Those which are onely fleshy, are easily amputated and made even with a razor; but such as are also bony cannot be cut off, unless with the cutting Mullets here described, and this is a disease of the Fingers in number. There is also another disease in Fingers, for they sometimes stick together,

gether, and otherwhiles they are very little separated. This fault happens either from the first original, by the errour of the formative faculty; or else it happens afterwards by accident, as by a Wound, or Burn ill cured. For neighbouring Fingers being ulcerated do easily grow together, unless they be 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 be divided with a sharp Razor; but if they be joined by the interposition of a more gross and dense substance, to wit, the nerves, tendons, and vessels being knit together on each side, it will be best not to meddle at all with the dividing them.

The cure of nails running into the flesh of the fingers.

Neither must we omit, that many have their nails run with such bony sharpness into the flesh of their fingers lying under them, that they cause most cruel pain; neither commonly do you avail any thing by paring 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 runs. Which I have done in many with happy success. Many 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 Cause.

The Cure.

When as the Prepuce or fore-skin is too short, it cannot cover the *Glans*. This happens either by Nature, to wit, by the first conformation, or afterwards by some accident, as to those whom Religion and the custom of their Nation bids to be circumcised. 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 Artery which are there between the two membranes of the Prepuce, be not cut in sunder. Hence it is drawn downward by extension, until it cover the *Glans*, a deficative emplaister being first put between it and the *Glans*, lest they should grow together. Then a Pipe being first put into the urinary passage, the Prepuce shall be there bound until the incision be 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-off-skin.

CHAP. XXXII.

Of Phimosis *and* Paraphimosis, *that is, so great a constriction of the Prepuce about the* Glans *or Nut, that it cannot be bared or uncovered at pleasure.*

The Causes.

The Cure.

The Prepuce is straightned about the *Glans* two ways; for it either covers the whole Nut, and so straightly encompasses the end thereof, that it cannot be drawn upwards, and consequently the Nut cannot be uncovered; or else it leaves the *Glans* bare under it, being fastned so stiffly to the roots thereof, that it cannot be turned up, nor drawn down, or over the *Glans*. The first manner of constriction is termed *Phimosis*, the latter *Paraphimosis*. The *Phimosis* happens either by fault of the first conformation, or else 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 be turned back. Whence it is that they cannot be handled and cured as you would, and a Gangrene of the part may follow, which may by the contagion bring death to all the body, unless it be hindred by amputation: but if a scar be the cause of the constriction of the prepuce, the Patient being placed in a convenient site, let the Prepuce be drawn forth and extended, and as much as may be stretched and enlarged, then let the scar be gently cut in three or four places on the inner side with a crooked Knife, but so, that the gashes come not to the outside, and let them be an equal distance each from other. But if a fleshly excrescence or a Wart shall be the occasion of this straitness and constriction, it shall be 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 every side, the Cure is not to be hoped for, much less to be attempted.

CHAP. XXXIII.

Of those whose Glans *is not rightly perforated, and of the too short or strait ligament, bridle, or cord of the Yard.*

The Cause.

The Cure.

Some at their birth, by evil conformation, have not their *Glans* perforated in the middle, but have only a small hole underneath, toward the bridle and ligament of the Yard, called the Cord. Which is the cause that they do not make water in a strait line, unless they turn up their Yard toward their belly, neither by the same reason can they beget children, because through this fault of conformation, the seed is hindred from being cast directly into the Womb. The Cure is altogether Chirurgical, and is thus performed. The Prepuce is taken hold of and extended with the left hand, but with the right hand, the extremity 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 hindred, because the seed cannot be cast directly and plentifully

tifully into the Womb. Therefore this ligament muſt be cut with much dexterity, and the wound cured after the manner of other wounds, having regard to the part.

Such as are born without a hole in their Fundament are not long-lived.

Children alſo are ſometimes born into the World with their fundaments unperforated, for a skin preternaturally covering the part, hinders the paſſage forth of the excrement; thoſe muſt have a paſſage made by Art with an Inſtrument, for ſo at length the excrements will come forth: yet I have found by experience, that ſuch Children are not naturally long-lived, neither to live many days after ſuch ſection.

CHAP. XXXIV.

Of the Cauſes of the Stone.

Why children are ſubject to the Stone in the Bladder.

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 cauſe of theſe is two-fold, that is, material and efficient. Groſs, tough, and viſcid humours, which crudities produce by the diſtempers of the bowels and immoderate exerciſes, chiefly and immediately after meat, yield matter for the Stone; whence it is that children are more ſubject to this diſeaſe than thoſe of other Ages: But the efficient cauſe is either the immoderate heat of the kidnies, by means whereof the ſubtiler part of the humours is reſolved, but the groſſer and more earthly ſubſides, and is hardned as we ſee Bricks hardned by the Sun and Fire; or the more remiſs heat of the bladder, ſufficient to bake into a ſtone the *faeces* or dregs of the Urine gathered in great plenty in the capacity of the Bladder. The ſtraightneſs of the Ureters and urinary paſſage may be accounted as an aſſiſtant cauſe: For by this means the thinner portion of the Urine floweth forth, but that which is more feculent and muddy being ſtaid behind, groweth as by ſcale upon ſcale, by addition and collection of new matter into a ſtony maſs. And as a wick often times dipped by the Chandler into melted Tallow, by the copious adhetion of the tallowy ſubſtance preſently becomes a large Candle; ſo the more groſs and viſcid *faeces* of the Urine ſtay as it were at the barrs of the gathered gravel, and by their continual appulſe are at length wrought and faſhioned into a true ſtone.

The Cauſe.

CHAP. XXXV.

Of the Signs of the Stone in the Kidnies and Bladder.

Why the thigh is numb in the Stone of the Reins.

THe ſigns of the Stone in the Reins, are the ſubſiding of red or yellow Sand in the Urine, a certain obſcure itching at the Kidnies, and the ſenſe of a weight or heavineſs at the loins, a ſharp and pricking pain in moving or bending the body, a numbneſs of the thigh of the ſame ſide, by reaſon of the compreſſion cauſed by the ſtone, of the nerves deſcending out of the *Vertebræ* of the loins of the thigh. But when the ſtone is in the Bladder, the fundament and whole *perinæum* is preſſed as it were with a heavy weight, eſpecially if the ſtone be of any bigneſs, a troubleſom and pricking pain runs to the very 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 ſometimes their urine cometh from them drop by drop. A moſt grievous pain torments the Patient in making water, which he is forced to ſhew by ſtamping with his feet, bending of his whole body, and the grating of his teeth. He is oft-times ſo tormented with exceſs of pain, that the *Sphincter* being relaxed, the right gut falleth down, accompanied with the ſwelling heat and pain of the *Hemorrhoid* veins of that place. The cauſe of ſuch torment is the frequent ſtriving of the bladder to expel the ſtone wholly contrary to the nature thereof, whereto by ſympathy the expulſive faculty of the guts and all the parts of the belly come as it were for ſupply. 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 attenuating the juices. The Patient looketh of a pale and yellowiſh complexion and hollow-eyed, by reaſon of the almoſt continual watching which is cauſed by the bitterneſs of pain; yet may it more certainly be known by putting in or ſearching with a *Catheter*. Which to do, the Patient ſhall be wiſhed to ſtand with his body ſomewhat ſtooping, leaning againſt ſomewhat with his back, and holding his knees ſome foot aſunder. Then the *Catheter* being bigger or leſſer, as the body ſhall require, and anointed with oil or butter, ſhall be thruſt with a skilful hand into the paſſages of the Urine, and ſo into the capacity of the bladder. But if the *Catheter* cannot come to that capacity, the Patient ſhall be placed in ſuch a poſture; then ſhall he be 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 he muſt almoſt lie when he is to be cut for the ſtone, as ſhall be ſhewn hereafter. For thus the *Catheter* is more eaſily thruſt into the Bladder, and ſhews there is a ſtone by the meeting and obſcure ſound of the obvious, hard and reſiſting body. You muſt have ſundry *Catheters*, that they may ſerve for every body bigger and leſſer, and theſe muſt be crooked, ſmooth and hollow. When being thruſt into the urinary paſſage (which before unawares I omitted) they come to the neck of the bladder, they muſt not be thruſt ſtraight into the bladder; but taking hold of the Yard with the left hand, they muſt be gently thruſt with the right directly into the bladder; eſpecially in men, by reaſon of the length and crookedneſs of the way, which tends in the form of this letter *S*. It is not ſo in women by reaſon of the ſhortneſs and ſtraitneſs of the neck of the bladder. It is fit your *Catheters* be hollow or fiſtulous in manner of a pipe, that they may receive a ſilver Wiar or String, that may hinder the groſs and viſcid humour, clotted bloud, or the like, from ſtopping the further end of the *Catheter*, through which the ſuppreſſed Urine ought to paſs and be made. But now as ſoon as we perceive that the *Catheter* is come into the capacity of the bladder, the Wiar muſt be drawn forth, that ſo the Urine may the freelier flow out by the hollowneſs of the *Catheter*. You may perceive the ſhapes of theſe inſtruments by this following Figure.

Signs of the Stone in the Bladder.

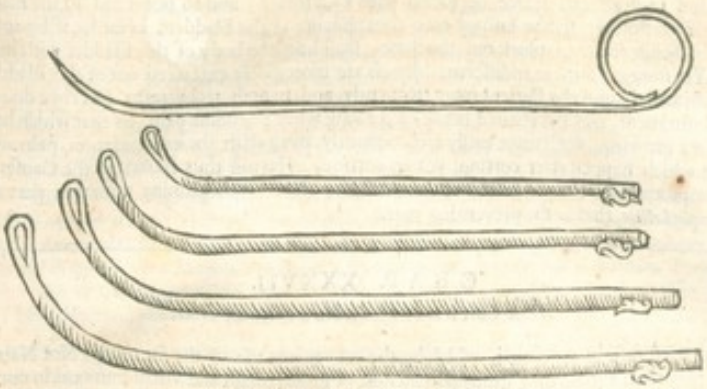
Why ſuch as have a ſtone in the Bladder are troubled with the falling of the Fundament.

How to ſearch for the Stone in the Bladder with a *Catheter*.

The Figure of the neck of the Bladder is different in Men and Women.

The

The Figure of Catheters, *and of a silver String or Wire.*



CHAP. XXXVI.

Prognosticks in the Stone.

WHen the Stone is cast forth of the Kidney (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 divers parts of our body double, all the Urine floweth into the other Ureter: But if they shall be both stopped with Stones, there is no doubt but the Urine will be wholly suppress, 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 body. Such as have a small stone cast forth of their Reins into the cavity of the Ureters, until this stone be fallen into the Bladder, have cruel pain with gripings, 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 wind: But by sneezing and coughing, or any other concussion of the whole body, a pricking pain is forthwith felt, whereas the stone stops, especially if it be either rough, or have sharp points like horns. This pain is communicated to the hip and thigh by sympathy, and some have the stones drawn up as it were with great violence. To these may be added the Colick, cholerick vomiting, and almost a general sweat. The stone in the Kidnies is most commonly bred in such as are ancient, by reason of the weakness of the expulsive faculty: But the stone in the Bladder happeneth to such as are more young, because the native heat is more vigorous in such, and strong and inordinate motions increase the strength of the expulsive faculty. When the stone is in the bladder, and the Urine appeareth bloudy, it is the sign of a small, as also a prickly and rough stone, for thus it more easily entereth into the neck of the bladder, and exulcerateth it being fleshy, whence the bloud cometh away with the Urine, and most cruel pain, as of needles thrust into the flesh, especially after labour and much exercise: on the contrary, a large and more smooth stone will not cause such tormenting pain, and it causeth a milky water. The shapes of stones in the kidnies are various, according to the variety of the strainers through which they pass whilest they are bred. Verily I have seen stones which represented the figure of Grayhounds, Hogs, and other Creatures, and things wholly contrary to mans nature, by the production of their prickles, and as it were branches. Some are four-square, others longish and like a finger, othersome of a round figure with many protuberancies like a Pine-apple kernel; neither is the variety less in magnitude, number, and colour; for some are yellowish, others whitish, red, ash-coloured, or some other like, according to the various temper of the affected bodies. The stones of cholerick and lean men usually concrete by preternatural heat and driness; 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 stops it up, and thence followeth a total suppressing of the Urine. Therefore then the Patient shall be placed upon his back and his legs being lifted up on high, he shall be 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 be forced back by thrusting in a *Catheter*. The pain which afflicteth such as have the stone is somewhiles continual, yet more frequently it cometh by fits and returns, sometimes monethly, 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 be gathered and grow into a stone of a just magnitude; yet stones breed in some Women, and those equally as big as in Men, and therefore they are to be cured by section and the like remedies. When the stone exceedeth the bigness of an Egg, it can scarce be taken away without tearing of the Bladder; whence happeneth an unvoluntary shedding of the Water, curable by no Art, because the bladder, seeing it is nervous and without bloud,

How death may ensue by the suppressing of Urine.

Why stones of the Kidnies have sundry shapes.

Why men are more subject to the stone then Women.

What ſtones cannot be taken out of the Bladder without killing the Patient.

bloud, being once torn admitteth no conſolidation: add hereto that inflammation and a gangrene often following the rending of the Bladder, brings inevitable death. The Patient runs the ſame hazard, if a long ſtone be pulled out ſidewiſe with your Inſtrument, or if it be incloſed in a membrane (which kind of ſtone can ſcarce be found with a Catheter) and ſo be faſtned to the Bladder, or otherwiſe if the ſtone it ſelf be faſtned into the ſubſtance of the Bladder; or laſtly, if by any chance the Surgeon being about to pluck out the ſtone, ſhall hurt the body 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 being 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 inflammation, pain and other ſymptoms which happen after cutting, yea in cutting. Having thus ſpoken of the Cauſes, Signs, Places, Symptoms, and Prognoſticks, we muſt come to the Cure, beginning with that part which is termed *Prophylactice*, that is the preventing part.

CHAP. XXXVII.

What Cure is to be uſed when we fear the Stone.

What Diet ſuch muſt uſe as fear the Stone.

Diet muſt firſt be 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 humours in our bodies. Therefore cold and cloudy air is to be ſhunned. They muſt abſtain from Fiſh, Beef, Pork, Water-fowl, Pulſe, Cheeſe, Milk-meats, fried and hard Egs, Rice, Cakes and all Paſtry, unleavened Bread, and laſtly, all manner of obſtructing meats. Alſo Garlick, Onions, Leeks, Muſtard, Spices, and laſtly, all things which over-heat the bloud and humours muſt be ſhunned, eſpecially if you fear that the ſtone is concrete by the heat of the reins. Standing and muddy Waters, thick, and troubled Wines, Beer, and ſuch kind of Liquors muſt be eſchewed. Satiety in meats and drinks is to be ſhunned, as that which breeds crudities. Alſo long watching and continual labour becauſe they inflame the bloud, cauſe crudities and preternatural heat, muſt carefully be eſchewed, as alſo more vehement paſſions of the mind. If the body be plethorick, then it muſt be evacuated by Phlebotomy, Purging, and Vomiting, which is accounted for a ſingular remedy for the prevention of this diſeaſe. For the performance of all which things a Phyſician ſhall be conſulted with. But becauſe Phyſicians are not in every place and always at hand, I have thought good to ſet down theſe following Medicins; yet we muſt firſt remember this Counſel of *Galen*; the uſe of Diureticks and ſtrong purging Medicins is hurtful, as often as there is inflammation in the reins and bladder, for ſo the conflux of the humours to the affected parts is the greater, whence the inflammation and pain are increaſed.

*Lib.*13. *Method.*

Wherefore firſt uſing relaxing Medicins, as ſix drams of *Caſſia* newly drawn, with ℈ iv. of *Rhubarb* in Powder mixed therewith, then lenitive and refrigerating Medicins ſhall be inwardly and outwardly uſed, ſuch as is this following ſyrup. ℞ *Summitatum malv. biſmal. & violar. an.* m. ſ. *rad. alth.* ʒ j. *glycyr.* ʒ ß. 4. *ſem. frigid. major. an.* ʒ j. *fiat decoctio.* ℞ *prædict. decoctionis* lb ß. *in colatura diſſolv. ſacc. albiſſ.* ʒ ij. *mellis albi* ℥ j. ß. *fiat ſyrupus ſecund. artem*; let the Patient uſe this often. This following Apozeme is alſo very effectual for the ſame purpoſe. ℞ *Rad. aſpar. gramin. polyp. quercini, paſſul. mund. an.* ℥ ß. *betonic. herniar. egrimon. omnium capill. & pimpinel. an.* m. ß. 4. *ſem. frigid. major. & ſem. fœnic. an.* ʒ j. *folior. ſen.* ʒ vj. *fiat decoct. ad* lb ß, *in colatura diſſolve ſyrupi de Althæa & de herniar. an.* ℥ j. ß. Make a clear Apozeme and let it be 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. ℞ *Hordei integr.* p. j. *radic. petroſelini, aceroſ. fœnic. cichor. bruſci an.* ʒ j. 4. *ſem. frigidorum conquaſſatorum an.* ℥ ß. *fol. aceroſ. portul. lactucæ, ſummitatum malvæ, & violar. an.* m. ß. *bulliant in aqua fluviatili cum gallo gallinaceo & crure vitulino*; let the broth be kept, and let the Patient take thereof ſix ounces for four days, in the morning two hours before meat, with an ounce of the juice of Citrons gently warmed with the ſame broth at the taking thereof: for thus, much urine will be made in a ſhort while after, full of a ſandy ſediment and a groſs viſcid humor. Whereby you may certainly gather, that this kind of broth is very effectual to cleanſe the paſſages of the Urine, neither in the interim doth it any harm to the ſtomach and other parts by which it paſſeth: ſo that it may be rightly termed a Medicinal nouriſhment. You may alſo profitably uſe this following Powder. ℞ *Nucleorum meſſilorum* ℥ j. *pul. electr. diamarg. frig.* ʒ ij. 4. *ſem. frig. major. mund. glycyrrhizæ razæ,* ʒ j. *ſem. ſaxifrag.* ʒ ij. ℈. *ſem. milii ſolis geniſt. pimpin. bruſci & aſparag. an.* ℈ j. *ſem. althææ,* ʒ ß. *ſacch. albiſſ.* ℥ vj. *fiat pulvis*; let him take a ſpoonful in the morning three hours before meat. Alſo ſome think that Lee made of the ſtalks and huſks of Beans is a good preſervative againſt this Diſeaſe. Beſides the uſe of this following Clyſter hath done good to many. ℞ *Fol. lactuc. ſcariol. portul. an.* m. j. *flor. viol. & nenuph. an.* p. j. *fiat decoctio ad* lb j. *in colatura diſſolve caſſiæ fiſtulæ* ℥ i. *mellis viol. & ſacc. rub. an.* ℥ j. ß. *olei viol.* ℥ iv. *fiat clyſter.* This which followeth is the fitter to aſſwage the pain. ℞ *Flor. cham. melil. ſummitat. aneth. berul. an.* p. ij. *fiat decoctio in lacte vaccino, in colatura diſſolve caſſiæ fiſtul. & ſaccar. alb. an.* ℥ j. *vitellos ovorum num.* ij. *olei anethini, & chamæm. an.* ʒ ij. *fiat clyſter.* In the interim let the Kidnies be anointed on the outſide with *unguentum roſatum, refrigerans Galeni* and *populeon* uſed ſeverally or mixed together, laying a double linnen cloth dipped in oxycrate. But if the concretion of the ſtone be of a cold cauſe, the remedies muſt be varied, as follows: ℞ *Terebinth. venet.* ʒ j. *cort. citri.* ʒ ij. *aquæ cocl.* ʒ ij. *fiat potio.* Or elſe, ℞ *Caſſiæ recent. extract.* ʒ vj. *benedict. laxat.* ʒ iij. *aq. fœnic.* ℥ ij. *aq. aſparag.* ℥ j. *fiat potio*; let him take it three hours before dinner. This following Apozeme is alſo good. ℞ *Rad. capet. bardan. & gram. an.* ʒ iij. *biſmal. cum tota, beton. an.* m. ſ. *ſem. milii ſolis hord. utrio an.* ʒ ij. *ſem. melon. glycyrrhiz. raſ. an.* ʒ ij. ſ. *ficus num.* 4. *fiat decoct. ad quart.* iij. *in expreſſa colatura, diſſolve ſyrup. de raphan. & oxymellitis ſcyllitici an.* ℥ j. ß. *ſacchar. albiſſ.* ʒ iv. *fiat*

A lenitive and lubricating ſyrup.

A Diuretick Apozeme.

A Diuretick and Lenitive Broth.

A Diuretick Powder.

The lee made of the aſhes of Bean-ſtalks a Diuretick.

Anodyne Clyſters in the Stone.

Remedies againſt the Stone of the Kidnies coming from a cold cauſe.

fiat apozema pro tribus dosibus, clarificetur & aromatiz. cum 3 j. *cinam. &* ʒ ß. *sant. citrin.* let him take four ounces three hours before dinner. ℞ *Rad. petrosel. fœnicul. an.* ʒ j. *saxifrag. pimpg. an. & bacc. an. an.* m. ℥. *quatuor seminum frig. major mundat. & milii solis an.* ʒ ij. *fiat decoctio. cape de colatura* lb ß. *in qua dissolve sacch. rub. & syrup. capill. ven. an.* ʒ j. ß. Let it be taken at three doses, two hours before meat. The following Powder is very effectual to dissolve the matter of the Stone. ℞ *Sem. petrosel. & rad. ejusdem mundat. an.* ʒ ß. *sem. cardui, quem eleoselinum vocant,* ʒ j. let them be dried in an Oven or Stone, with a gentle fire, afterwards let them be beaten severally and make a Powder, whereof let the Patient take ℈ j. ß. or two scruples with white Wine, or Chicken-broth fasting in the morning by the space of three days. Or, ℞ *Coriand. præp.* ℈ iv. *anis. marathri, granor. alkekengi, milii solis, an.* ʒ ij. *zazarib. & cinam. an.* ℈ ij. *turbith. electi* ʒ j. *cari* ℈ ij. *galang. nucis moschat. & lapid. judaici, an.* ℈ j. *fol. fœnæ mund. ad duplum omnium, discrydii* ʒ ij. ß. *misce, fiat pulvis:* the dosis is about ʒ j. with white Wine three hours before meat. Against the flatulencies which much distend the guts in this kind of Disease, Clysters shall be thus made; ℞ *Malv. bisinal. pariet. origani, calament. flor. chamæm. summitat. anethi, an.* m. ß. *anisi, carui, cumini, fœnic. an.* ʒ ß. *baccar. laur.* ʒ iij. *sem. rutæ* ʒ ij. *fiat decoctio, in colatura, dissolve bened. lax. vel diaphœnic.* ʒ ß. *confect. hac. lauri* ʒ iij. *saccharr. rub.* ʒ j. *olei anethi. chamæm. & rutæ. an.* ʒ j. *fiat clyster.* Or ℞ *Olei nucum & vini mal. an.* lb ß. *aq. vitæ* ʒ ß. *fiat clysterr*; let it be kept long, that so it may have the more power to discuss the wind. Carminative Clysters.

CHAP. XXXVIII.

What is to be done when the stone falleth out of the Kidnies into the Ureter.

Signs of the stone stopping in the ureter.

OFt-times it falleth out that the reins using their expulsive faculty, force down the stone (whose concretion and generation the Physicians by the formerly prescribed means could not hinder) from themselves into the Ureters; but it stayeth there either by reason of the straightness of the place, or the debility of the expulsive faculty. Therefore then cruel pain tormenteth the Patient in that place whereas the stone sticketh, which also by consent may be communicated to the Hip, Bladder, Testicles, and Yard, with a continual desire to make Water and go to Stool. In this case it behoveth the Physician that he supply the defect of Nature, and assist the weak endeavours.

Remedies to force down the stone sticking in the ureter.

Therefore let the Patient, if he be able, mount upon a trotting Horse, and ride upon him the space of some two miles, or if he can have no opportunity to do so, then let him run up and down a pair of stairs, until he be weary, and even sweat again; for the stone by this exercise is oft-times shaken into the Bladder; then presently shall be given or taken by the mouth such things as have a lenitive and relaxing faculty, as Oil of Sweet Almonds newly drawn, and that without fire, and mixed with the Water of Pellitory of the Wall and White Wine. Let frictions of the whole body be made from above downwards with hot cloths; let Ventoses with a great flame be applied one while to the loins, and another while to the bottom of the belly, a little below the grieved place; and unless the Patient vomit of his own accord, or by the bitterness of his pain, let vomiting be procured with a draught of Water and Oil luke-warm; for vomiting hath much force to drive down the stone by reason of the compression of the parts, which is caused by such an endeavour. Lastly, if the stone descend not by the power of these remedies, then the Patient must be put into a *Semicupium*, that is, a Half-bath, made of the following decoction. ℞ *Malvæ, bisinal. cum toto an.* m. ij. *beton. nasturt. saxifrag. berul. pariet. ar. violar. an.* m. iij. *sem. melonum, milii solis, alkekengi an.* ʒ vj. *cicer. rub.* lb j. *rad. apii. gram. fœniculi, & eringii. an.* ʒ iv. *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 tarry longer in such a bath than is requisite, for the spirits are dissipated, and the powers resolved by too long stay therein. But on the contrary, 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 be not moved by this means any thing at all out of the place, and that the same total suppression of Urin does as yet remain, neither before the Patient entered into the bath the putting of a *Catheter* into the bladder did any thing avail, yet notwithstanding he shall try the same again after the Patient is come out of the bath, that he may be throughly satisfied whether peradventure there may be any 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 eatily, the parts being relaxed by the warmness of the bath: then inject some Oil of Sweet Almonds with a Syringe into the *Urethra* or passage of the yard; whilest all these things are in doing, let not the Patient come into the cold air. But I have thought good to describe a Chair for a Bath, wherein the Patient may fitly sit, as you may see in the following Figure. A Decoction for a Bath.

There may also be another decoction made for the bath, as thus: ℞ *Rad. raph. alth. an.* lb ij. *rad. ruse. petrosel. & asparag. an.* lb j. *cumin. fœnicul. amcos an.* ʒ iv. *semdini, fœnug. an.* ʒ vj. *fol. marrub. pariet. flor. um chamæm. melil. anethi, an.* m. ij. *bulliant omnia secundum artem in aquæ sufficienti, & vini albi odoriferi exigua quantitate ad consumptionem tertiæ partis pro Semicupio.* Also the same decoction may be used for Clysters, adding thereto two yolks of Egs, and four ounces of Oil of Lillies, with ʒ j. of Oil of Juniper, which hath a certain force to assuage the pain of the Stone and Collick. But a far less quantity of the decoction in a Clyster must be used in these diseases, than usually is appointed in other diseases; otherwise there will be danger lest the guts being distended, should more press upon the kidnies and ureters, troubled in some sort with inflammation, and so increase the pain and other symtoms. This following Cataplasm shall be profitably applied to the grieved place, to wit, the loins, or flanks, and bottom of the belly, for it is very powerful to assuage pain, and help forwards the falling down of the stone. ℞ *Rad. alth. & raphani, an.* ʒ iv. *pariet. fœnic. senecionis, nasturt. berul. an.* m. j. *berniariæ* m. ß. *omnibus in aqua sufficienti decoctis, & deinde contritis, adde olei anethi. chamæm. & pingued. cuniculi,* An anodyne Cataplasm.

Signs of the Stone fallen out of the ureters into the bladder.

cuniculi, an. ℥ ij. *farin. cicer. quantum ſufficit, fiat cataplaſma ad uſum prædictum.* After, by theſe means, the ſtone forced out of the ureter is fallen into the bladder, the pain preſently (if there be but one ſtone, for ſometimes 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 he be very weak, it is fit that he ride and walk afoot, and take ʒ 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 he hath drunk, let him hold in his Urin as long as he can; that ſo it being gathered in great plenty, 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.* ℥ j. *aquæ alkekengi* ℥ iij. *olei ſcorpionum* ℥ β. Let it be injected into the bladder with a ſyringe.

The Figure of a Chair for a Semicupium.

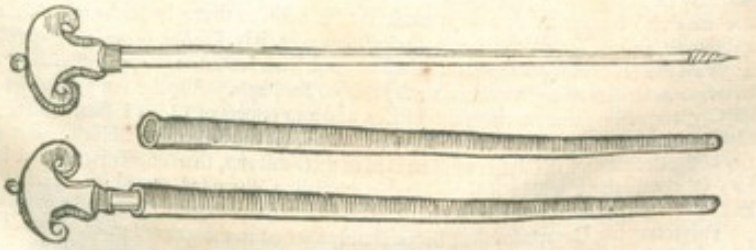
A *Sheweth the whole frame of the Chair.*
B *The hole wherein the Patient muſt ſit.*
C *The Ciſtern that holds the Water.*
D *A Cock to empty the Water when it groweth cold.*
E *A Funnel whereby to pour in warm water.*

CHAP. XXXIX.

What muſt be done to the Stone being fallen into the neck of the Bladder, or paſſage of the Yard.

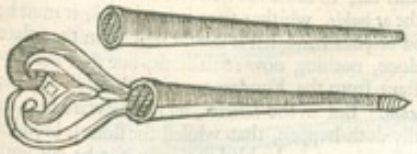
AFter the ſtone is fallen out of the capacity of the Bladder, and ſtops in the neck thereof, or paſſage of the Yard, the Surgeon ſhall have a ſpecial care that he do not force or thruſt back the ſtone from whence it came, but rather that he preſs it gently with his fingers to the end of the Yard, the paſſage being firſt made ſlippery by injecting ſome Oil of Sweet Almonds. But if it ſtop in the end of the *Glans*, it muſt be plucked out with ſome crooked inſtrument; to which if it will not yield a Gimblet with a Pipe or caſe thereto, ſhall be put into the paſſage of the Yard, and ſo it ſhall be gotten out, or elſe broken to pieces by the turning or twining about of the Gimblet, which I remember I have divers times attempted and done; for ſuch Gimblets are made with ſharp Screws, like ordinary Gimblets.

The delineation of a Gimblet made to break the ſtones in the paſſage of the Yard, together with its Pipe, or Caſe.



CHAP.

The effigies of another lesser Gimblet.



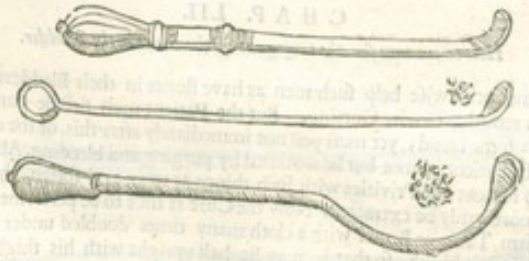
Verily what Gimblets soever are made for this business, their body or point must be no thicker than a small *Probe*; lest whilest they are forced or thrust into the *Urethra*, or urinary passage, they might hurt the bodies next unto them by their violent entrance.

CHAP. XL.

What course must be taken, if the stone sticking in the Urethra, *or urinary passage, cannot be gotten out by the fore-mentioned Arts.*

BUt if the stone be more thick, hard, rough and remote from the end of the Yard, than that it may be gotten out by the means formerly mentioned in the precedent Chapter, and if that the urin be wholly suppresst 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 artery lieth thereunder; nor in the lower part, for so it would scarce ever heal again, for that it is a bloudless part, and besides, the continual and acrid falling of the urine would hinder the agglutination: wherefore the incision must be made on the side, on that part whereas the stone most resists and swells out. For that part is the more fleshy; yet first the end of the skin of the prepuce must be much drawn up so to cover the *Glans*, which being done, the *Urethra* shall be tied with thred a little above the stone, that so the stone may be staid there, and may not fall back again. Therefore then, incision being made, the stone must be taken forth, and the skin which was drawn more violently to cover the *Glans*, is to be let go back again; for so it will come to pass that a whole part of the skin may cover the cut Yard, and so it may be the more speedily united, and the urin may naturally flow out. I have by this means oft-times taken forth the stone with the instruments here delineated. When the Yard may be safely cut.

Instruments fit to take the stone forth of the opened Urethra, *or urinary passage of the Yard.*



Then for the agglutination, if need require, it will be requisit to sew up the lips of the wound, and apply this agglutinative Medicin following. ℞ *Tereb. venet.* ℥ iv. *gum. elemi*, ℥ j. *sang. dracon. & mastic. an.* ʒ ß. *fiat medicamentum aut dictum ut*: then the whole Yard must be covered over with a repercussive Medicin made of the whites of Eggs, with the Powder of Bole Armenick, Aloes, *farina volatilis*, and Oil of Roses. Lastly if need so require, a Wax-candle, or Leaden string anointed with Venice Turpentine shall be thrust into the *Urethra*, to hasten the agglutination, and retain the natural smoothness and straightness of the urinary passage, lest peradventure a caruncle grow therein. An agglutinative medicin. How to hasten the agglutination.

CHAP. XLI.

What manner of Section is to be made when a stone is in a Boys Bladder.

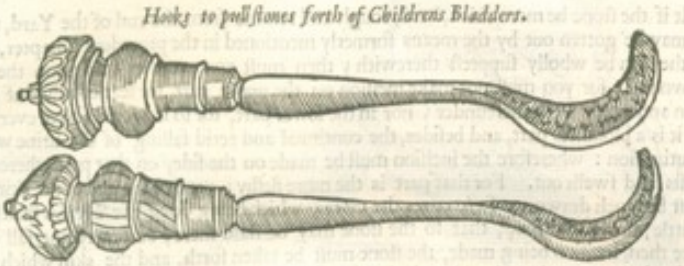
HItherto we have shewed, by what means it is convenient to draw small stones out of the Ureter, Bladder, and passage of the urin; now will we briefly shew the manner of taking of greater stones out of the bladder, which is performed by incision and iron instruments, and I will deliver the practice thereof 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 be 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 cause a strong man, sitting upon an high seat, to lay the child upon his back with his face from him-ward, having his hips lying upon his knees. The child must lie somewhat high, that he may breath the freelier, and let not the nervous part be too much stretched, but let all parts be loose and free for the drawing forth of the stone. Furthermore, it is fit that this strong man, the childs legs being bended back, with the child, that putting his legs to his hams, that he draw them up as much as he can, and let the other be sure he keep them so; for this site of the child 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 childs Fundament as he is able; but Why the Boy must be shaken before cutting. How to place the child before dissection.

let him with his other hand preſs the lower belly, firſt wrapping a cloth about his hand, that ſo the compreſſion may be the leſs troubleſom, and leſt inflammation ſhould happen rather by this means than by the inciſion. Now the compreſſion hath this uſe, to cauſe 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 be there kept, and as it were governed by the command of your hand, leſt it ſhould ſlide from that place whereto you have brought it. Theſe things thus done, nothing now remaineth, but that the Surgeon, with a wound ſome two fingers bredth 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 he hurt not the *inteſtinum rectum*; for it may, and uſually doth happen, that whileſt the ſtone is brought out of the bottom of the bladder to the neck thereof, this gut is doubled in: now if it be cut with your inciſion-knife, it cometh to paſs that the excrements may ſometimes come out at the wound, and the urin by the fundament, which thing hath in many hindred the agglutination and conſolidation of the wound; yet in ſome others it hath done little harm, becauſe in this tender age many things happen which may ſeem to exceed Nature: the inciſion being made, the ſtone muſt be plucked forth with the inſtrument here expreſſed.

Where to divide the *perinæum*.

Nature very powerful in children.

Hooks to pull ſtones forth of Childrens Bladders.



The ſtone being drawn out, a ſmall pipe ſhall be put into the wound, and there kept for ſome ſpace after, for reaſons hereafter to be delivered; then his knees ſhall be bound together, for thus the wound will the ſooner cloſe and be agglutinated. The reſidue of the Cure ſhall be performed by reducing the general Cure of Wounds to the particular temper of the childs age, and the peculiar nature of the child in cure.

General Rules muſt be reduced to particular bodies.

CHAP. LII.

How to cut men for the taking out of the Stone in the Bladder.

What to be done before diſſection.

SEeing we cannot otherwiſe help ſuch men as have ſtones in their Bladders, we muſt come to the extreme remedy, to wit, Cutting. But the Patient muſt firſt be purged, and if the caſe require, draw ſome bloud; yet muſt you not immediately after this, or the day following haſten to the work: for the Patient cannot but be weakned by purging and bleeding. Alſo it is expedient for ſome days before to foment the Privities with ſuch things as relax and ſoften, that by their yielding, the ſtone may the more eaſily be extracted. Now the Cure is thus to be performed. The Patient ſhall be placed upon a firm Table or Bench with a cloth many times doubled under his buttocks, and a Pillow under his loins and back, ſo that he may lie half upright with his thighs lifted up, and his legs and heels drawn back to his buttocks. Then ſhall his feet be bound with a ligature of three fingers bredth caſt about his ankles, and with the heads thereof being drawn upwards to his neck, and caſt about it, and ſo brought downwards, both his hands ſhall be bound to his knees, as the following figure ſheweth.

How to lay the Patient.

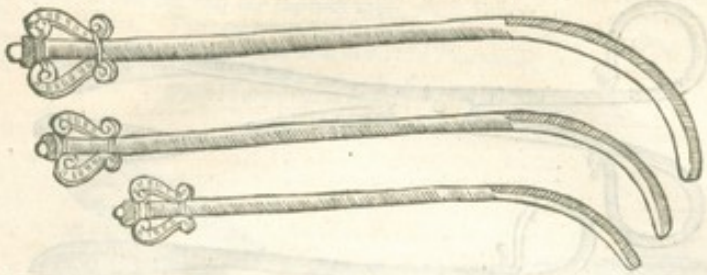
The Figure of a man lying ready to be cut of the Stone.

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 he may neither move his limbs, nor ſtir his buttocks, but be forced to keep in the ſame poſture with his whole body. Then the Surgeon ſhall thruſt into the urinary paſſage even to the bladder a ſilver or iron and hollow Probe anointed with Oil, and opened or ſlit on the outſide, that the point of the knife may enter thereinto, and that it may guide the hand of the Workman, and keep the knife from piercing any further into the bodies lying there-under. The Figure of this Probe is here expreſſ.

Why the Probe muſt be ſlit on the outſide.

Probes

Probes with slits in their ends.



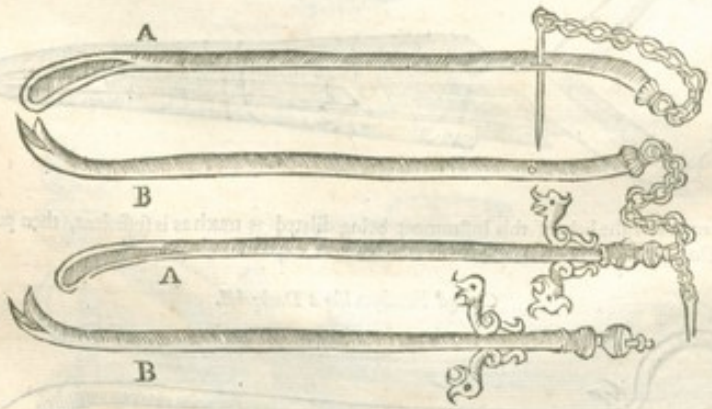
He shall gently wrest the Probe, being so thrust in, towards the left side, and also he who standeth on the Patients right hand, shall with his left hand gently lift up his cods, that so in the free and open space of the left side of the *Perinæum*, the Surgeon may have the more liberty to make the incision upon the Probe, which is thrust in and turned that way. But in making this incision, the Surgeon must be careful that he hurt not the seam of the *Perinæum* and Fundament. For if that seam be cut, it will not be easily consolidated, for that it is callous and bloudless, therefore the urin would continually drop forth this way. But if the wound be made too near the Fundament, there is danger left by forcible plucking forth of the stone he may break some of the hæmorrhoid veins, whence a bleeding may ensue, which is scarce to be stopped by any means, or that he may rend the sphincter muscle, or body of the bladder, so that it never can be repaired. Therefore it must be made the space of two fingers from the fundament, according to the straightness of the fibres, that so it may be 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 Crows-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 some one of these silver instruments delineated here below, and called by the name of *Guiders*, for that they serve as guides to the other instruments which are to be put into the bladder; these are made with a round and prominent head, whereby it may be put into the described cavity 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 be put under the former, being made forked at the end, that so it may, as it were, embrace the end of the former.

Why the seam of the *Perinæum* must not be cut.

Where to make the wound to take forth the stone.

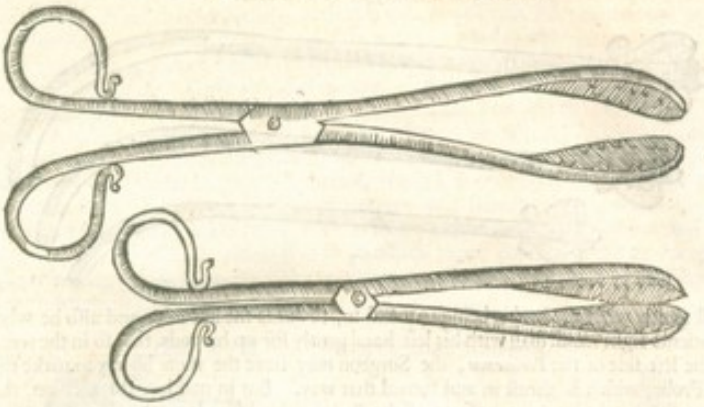
That which is torn sooner healeth than that which is cut.

The Figures of Guiders of two sorts.



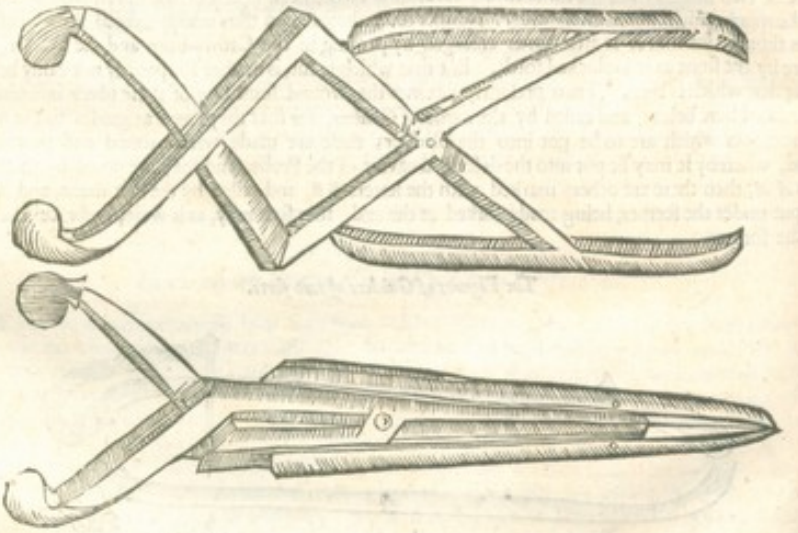
Now the Probe is to be drawn forth, and the Guiders to be thrust and turned up and down in the bladder, and at length to be staid there by putting in the pin; yet such Guiders as want a Pin are fitter for the hand, and are by some called *βαθρα*. Then must they be held betwixt the Surgeons fingers. It will be also necessary for the Surgeon to put another instrument called the Ducks-bill between the two guiders into the capacity of the bladder; he must thrust it in somewhat violently, and dilate it so thrust in with both his hands, turning it every way to enlarge the wound as much as shall be sufficient for the admitting the other instruments which are to be put into the bladder; yet it is far better for the Patient, if that the wound may with this one instrument be sufficiently dilated, and the stone pulled forth with the same without the help of any other.

The effigies of an Inſtrument called a Ducks-bill.



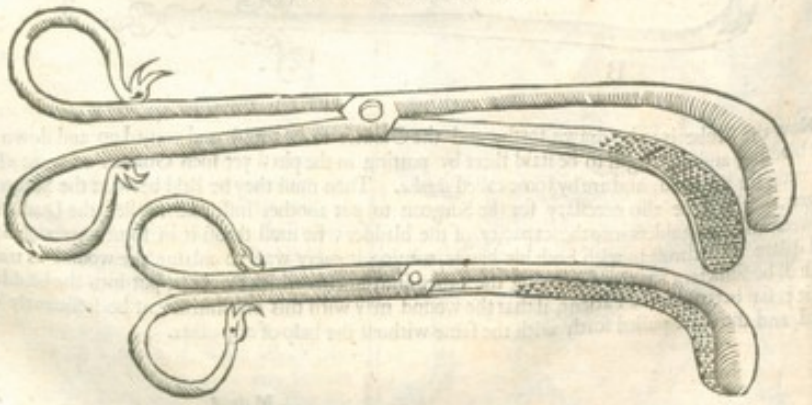
Which if you have not in readineſs, and the largeneſs of the ſtone require more dilatation, then muſt you put in this dilater; for being put into the bladder, and the handle preſſed together, it will dilate the inciſion as much as you deſire.

The Figure of a Dilater ſhut and opened.



The wound by the help of this Inſtrument being dilated as much as is ſufficient, then put in the ſtraight Ducks-bill before deſcribed, or the crooked here expreſt.

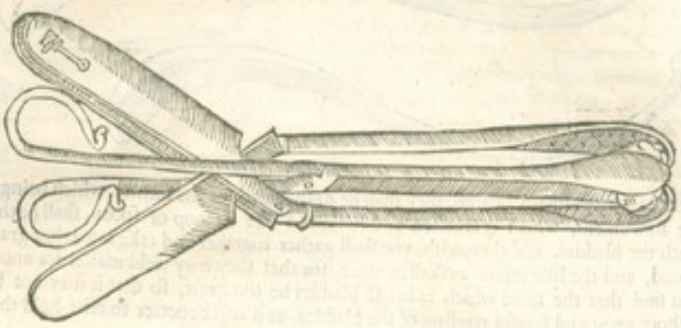
Crooked Forcipes *like a Ducks-bill.*



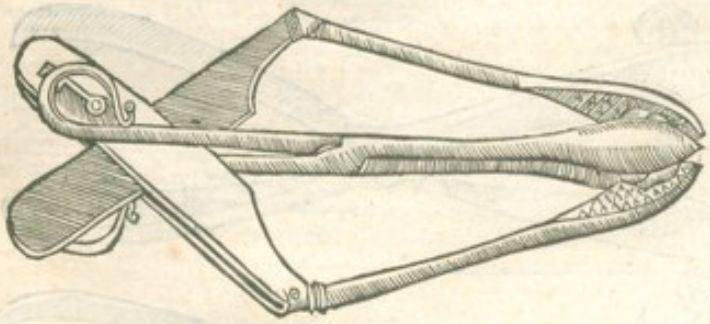
The ſtone may be ſought and taken hold of with theſe Inſtruments, and being taken hold on, the branches of the Inſtrument ſhall be tied together, leſt they ſhould ſuffer that to ſlide away which

which they have once taken hold of. Neither shall the stone be 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 straitly in the *forceps*, lest you should break it in pieces: Some, lest it should slip away, when they have once taken hold thereof, put their two fingers into the Fundament, and put them about 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.

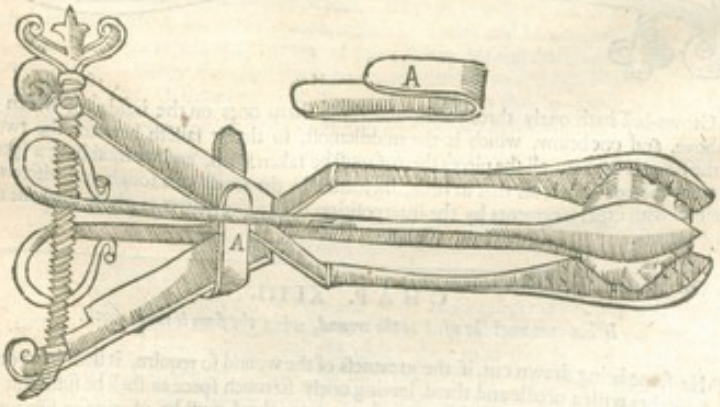
Winged Instruments to hold the stone with the Ducks-beak.



The Figure of another.

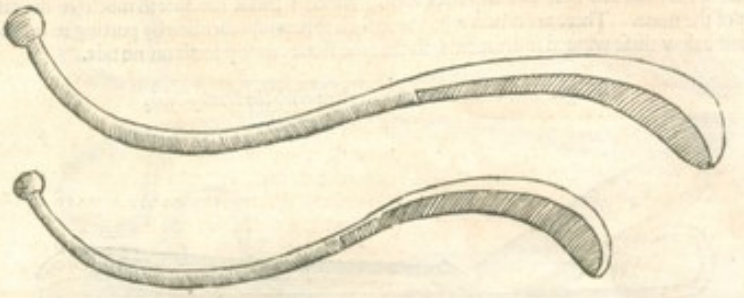


The Figure of another winged Instrument, the end of whose handle is fastned by a screw, as also a bended iron plate, which is marked with this letter A, for the firmer holding thereof.



After the stone is by this means drawn forth, observe diligently whether it be worn on any 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, than by searching with a Catheter. The one end of the following Instrument may supply the want of a Catheter or Probe, and the other may serve for a scoop or cleanser. A note of more stones than one.

A Cleanſer or Scoop whereby you may ſearch whether there be any more ſtones behind, as alſo cleanſe or purge the bladder from gravel, clots of bloud, and other ſuch bodies as uſe to remain behind after the drawing forth of the ſtone.



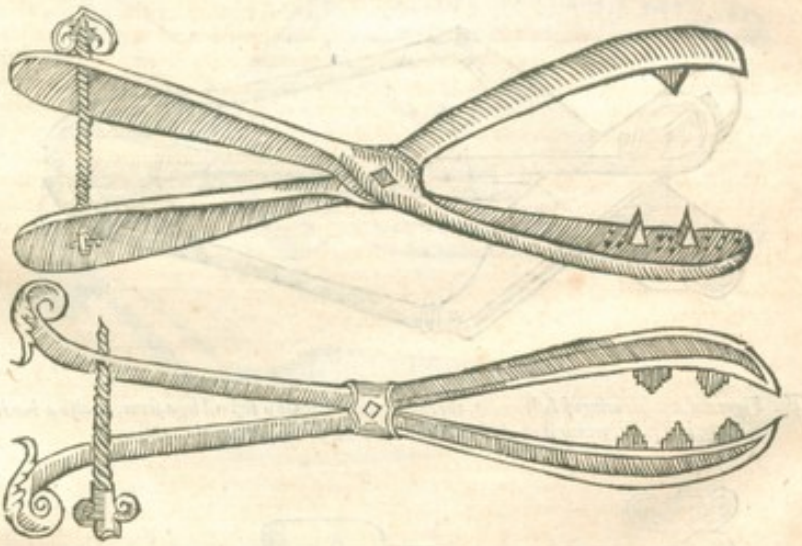
How to cleanſe the bladder.

For if other ſtones remain behind, they ſhall be drawn forth as the former, which being done, the end of the Inſtrument, which is crooked and hollowed like a ſcoop or ſpoon, ſhall be thruſt by the wound into the bladder, and therewith you ſhall gather together and take out what gravel ſoever, clotted bloud, and the like refuſe as ſhall be there, for that they may yield matter for another ſtone.

How to break a ſtone that cannot be taken out whole and at once.

But if you find that the ſtone which is in the bladder be too great, ſo that it may not be plucked forth without great and fearful rending of the bladder, as it will be better to take hold thereof with this Crows bill, and ſo break it to pieces.

The effigies of a toothed Crows-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 middlemoſt, ſo that it falleth between the two upper. When the ſtone is broken, all the pieces thereof muſt be taken forth, and we muſt have a ſpecial care, leſt any piece thereof lie hid, for that in time, increaſed by the acceſs of a tough and viſcous 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.

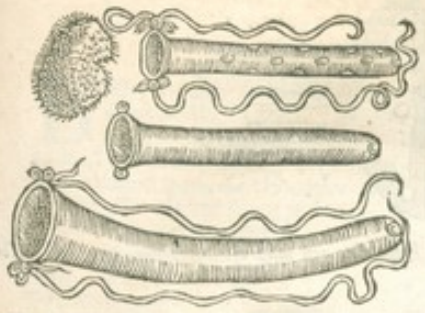
What cure muſt be uſed to the wound, when the ſtone is taken forth.

Of ſewing the wound when the ſtone is taken forth.

THe ſtone being drawn out, if the greatneſs of the wound ſo require, it ſhall have one or two ſtitches with a needle and thred, leaving onely ſo much ſpace as ſhall be ſufficient to put in a pipe for the uſe we ſhall hereafter ſhew; your thred muſt be of crimſon ſilk waxed, and let it not be too ſmall, leſt it by binding ſhould cut aſunder the fleſhy lips of the wound, or rot in a ſhort time, either by the moiſture of the Urin, or matter flowing from the Ulcer. Therefore you ſhall take up much fleſh with the skin in ſewing it, leſt the lips of the wound being torn, your labour prove in vain, and ſo you are forced to trouble the Patient with making a new one. Things being thus performed, a ſilver pipe ſhall be put through the wound into the bladder, whereof I have here given you divers forms, that you may take your choice, and 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

Silver Pipes to be put in the Bladder when the stone is drawn out.



These must have no holes in their sides (as those here expressed) but only in their ends, that all the matter of the wound, and the filth gathered and concrete in the bladder may flow and be carried forth this way. When clear Urine shall begin to flow out of the wound, there shall be no more need of a Pipe; therefore if you continue it and keep it longer in the wound, there is some danger left Nature accustomed to that way, may afterwards neglect to send the Water through the *Urethra*, or urinary passage. Neither must you forget to defend the parts near to the wound with the following repercussive Medicin, to hinder the defluxion and inflammation, which are incident by reason of the pain. ℞ *Album. ovorum, nu.* iij. *pul. boli armeni, sanguinis draconis. an.* ℥ iij. *olei ros.* ℥ j. *pilorum leporinum quantum sufficit:* make a Medicin of the consistence of honey.

A repercussive Medicin.

CHAP. XLIV.

How to lay the Patient after the Stone is taken away.

ALl things which we have recited, being 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 Urin which floweth from him. You must have divers of these pillows, that they may be changed as need shall require. Sometimes after drawing forth of the stone, the bloud in great quantity falleth into the Cod, which unless you be careful to provide against, with discussing, drying and consuming Medicins, it is to be feared that it may gangrenate. Wherefore if any accident happen in curing these kind of Wounds, you must diligently withstand them. After some few days a warm injection shall be 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 sometimes happens, that after the drawing forth of the stone, clots of bloud and other impurity may fall into the urinary passage, and so stop the Urin that it cannot flow forth. Therefore you must in like sort put a hollow Probe for some days into the *Urethra*, that keeping the passage open, all the grosser filth may flow out together with the Urin.

Remedies for the Cod, lest it gangrenate.

CHAP. XLV.

How to cure the Wound made by Incision.

YOu must cure this wound after the manner of other bloudy wounds, to wit, by agglutination and cicatrization, the filth, or such things as may hinder, being taken away by detergent Medicins. The Patient shall hasten the agglutination if he lie cross-legged, and keep a slender diet until the seventh or nineth day be past. He must wholly abstain from Wine, unless it be very weak; in stead thereof let him use a decoction of Barley and Licorish, or Mead, or Water and Sugar, or boiled Water mixed with Syrups of dried Roses, Maiden-hair, and the like. Let his Meat be Panado, Raisins, stewed Prunes, Chickens boiled with the cold Seeds, Purslain, Sorrel, Borage, Spinage, and the like. If he be bound in his belly, a Physician shall be called, who may help it, by appointing either *Cassia*, a Clyster, or some other kind of Medicins as he shall think good.

What things hasten the union.

CHAP. XLVI.

What cure is to be used to Ulcers, when as the Urine flows through them, long after the stone is drawn out.

MAny after the stone is drawn out, cannot have the Ulcer consolidated, therefore the Urin flows out this way continually by little and little, and against the Patients will during the rest of his life, unless the Surgeon help it. Therefore the callous lips of the wound must be amputated, so to make a green wound of an old ulcer; then must they be tied and bound with the instrument we term a *Retinaculum* or stay; this must be perforated with three holes, answering to three other on the other side; Needles shall be thrust through these holes, taking hold of much flesh, and shall be knit about it, then glutinative Medicins shall be applied, such as are Venice Turpentine, Gum *Elemi*, *Sanguis draconis*, Bole Armenick, and the like; after five or six days the Needles shall be taken out and also the stay taken away. For then you shall find 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

The Figure of a Retinaculum, *or Stay.*

A *Shews the greater.* B *The lesser, that you may know that you must use divers according to the different bigness of the Wound.*

What to do in want of a stay.

If a *Retinaculum* or Stay be wanting, you may conjoin the lips of the Wound, after this following manner. Put two Quills somewhat longer than the Wound, on each side one, and then presently thrust them through with Needles having Thread in them, taking hold of the flesh between, as often as need shall require, then tying the thread upon them. For thus the Wound shall be agglutinated, and the fleshy lips of the wound kept from being torn, which would be in danger if the needle and thred were onely used.

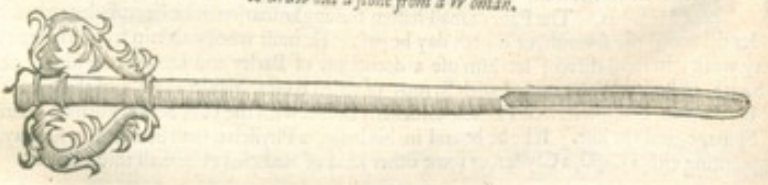
CHAP. XLVII.

How to take stones out of Womens bladders.

How to search for the stone in Women.

WE know by the same signs that the stone is in a womans bladder as we do in a mans, yet it is far more easily searched by a Catheter, for that the neck of the bladder is the shorter, broader, and the more straight. Wherefore it may not onely be 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 placing the sick woman in the same posture as we mentioned in the cure of men. Yet you must observe that maids younger than seven years old, that are troubled with the stone, cannot be searched by the neck of the womb, without great violence. Therefore the stone must be drawn from them by the same means as from Boys, to wit, by thrusting the fingers into the Fundament; for thus the stone being found out, and the lower belly also prest with the other hand it must be brought to the neck of the bladder, and then drawn forth by the forementioned means. Yet if the riper years of the Patient permit it to be done without violence, the whole work shall be 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 than it is to the right gut. Wherefore the fingers thus thrust in, a Catheter shall be presently put into the neck of the bladder: This Catheter must be hollow, or slit on the outside like those before described but not crooked, but straight, as you may perceive by the following Figure.

A Catheter, *upon which, being put into the bladder, the neck thereof may be cut to draw out a stone from a Woman.*



Upon this Instrument the neck of the bladder may be cut, and then with the Dilater made for the same purpose, the incision shall be dilated as much as need requires; yet with this caution, that seeing the neck of a womans bladder is the shorter, it admits not so great dilation as a mans, for otherwise there is danger that it may come to the body of the bladder, whence an involuntary shedding of the water may ensue and continue thereafter. The incision being 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 he shall easily pluck out the stone, which he shall keep with his fingers from slipping back again. Yet *Laurence Colo* the Kings Surgeon, and both his sons (than 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 themselves with putting in onely the Guiders (whereof we formerly made mention) into the passage of the Urine, they presently thereupon make straight incision directly at the mouth of the neck of the bladder, and not on the side as is usually done in men. Then they gently by the same way thrust the *forcipes* hollowed on the outside formerly delineated, and so dilate the wound by tearing it as much as shall be 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 be added, that if an ulcer grow in the neck of the bladder by reason of the rending it, you may by putting in the *specillum matricis*, dilate the neck of the womb, that fitting remedies may be applied with the more ease.

CHAP.

CHAP. XLVIII.

Of the suppression of the Urin by internal causes.

In suppression of the urin we must not presently fly to Diureticks.

Besides the fore-mentioned causes of suppressed Urin, or difficulty of making water there are many other, lest any may think that the Urin is stopt onely by the Stone or Gravel, as Surgeons think, who in this case presently use Diureticks. Therefore the Urin is suppresst by external and internal causes. The internal causes are clotted bloud, tough phlegm, warts, caruncles bred in the passages of the Urin, stones and gravel; the Urin is sometimes suppresst, because the matter thereof, to wit, the serous or whayish part of the bloud, is either consumed by the feverish heat, or carried other ways by sweats or a scouring; sometimes also the flatulency there contained, or inflammation arising in the parts made for the Urin and the neighbouring members, suppresses the Urin. For the right gut, if it be inflamed, intercepts the passage of the Urin, 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 Urin is oft-times suppresst in such as have the dropsie; or else by dulness or decay of the attractive or separative faculty of the reins by some great distemper, or by the default of the animal faculty, as in such as are in a Phrensie, Lethargy, Convulsion, Apoplexy. Besides also a tough and viscid humour falling from the whole body into the passages of the Urin, obstructs and shuts up the passage. Also too long holding the water sometimes causes this affect. For when the bladder is distended above measure, the passage thereof is drawn together and made more straight: hereto may be added, that the too great distension of the bladder is a hinderance that it cannot use the expulsive faculty, and straighten it self about the Urin to the exclusion thereof; hereto also pain succeeds which presently dejects all the faculties of the part which is seized upon. Thus of late a certain young man riding on horse-back before his Mistress, and therefore not daring to make water, when he had great need so to do, had his Urin so suppresst, that returning from his journy home into the City, he could by no means possible make water. In the mean time he had grievous pain in the bottom of his belly and the *Perinæum*, with gripings and a sweat all over his body, so that he almost swooned. I being called, when I had procured him to make water by putting in a hollow Catheter, and pressing the bottom of his belly, whereof he forthwith made two pints; I told them that it was not occasioned by the stone, which notwithstanding the standers by imagined to be the occasion of that suppression of Urin. For thence forward there appeared no signs of the stone in the Youth, neither was he afterwards troubled with the stopping of his Urin.

Why the too long holding the urin causeth the suppression thereof.

An history.

CHAP. XLIX.

A digression concerning the purging of such things as are unprofitable in the whole Body by the Urin.

I Think it not amiss to testifie by the following Histories, the providence of Nature in expelling by Urin such things as are unprofitable in the whole body. *Monsieur Sarres* the Kings Secretary was wounded in the right arm with a Pistol bullet; many and malign symptoms happened thereupon, but principally great inflammations, flowing with much *sanies* and *pus* or quitture: it sometimes happened that without any reason, this purulent and sanious efflux of matter was staid in inflammation; whereof while we solicitously inquired the cause, we found both his stools and water commixed with much purulent filth, and this through the whole course of the disease, whereof notwithstanding by Gods assistance he recovered, and remains whole and sound: we observed that as long as his arm flowed with this filthy matter, so long were his excrements of the belly and bladder free from the sanious and purulent matter: as long on the contrary as the ulcers of the arm were dry, so long were the excrements of the guts and bladder sanious and purulent. The same accident befel a Gentleman called *Monsieur de la Croix*, who received a deadly wound with a sword on the left arm, though *German Cheval* and Master *Rasi* most expert Surgeons, and others, who together with me had him in cure, though it was not so for this reason, because the *pus* cannot run so long a way in the body, neither if it were so, could that be done without the infection and corruption of the whole mass of bloud, whilest it flows through the Veins; therefore to be more probable that this quantity of filth, mixed with excrements and urine, flowed out by the default of the liver, or of some other bowel, rather than from the wounded arm. I was of a contrary opinion for these following reasons: First for that which was apparently seen in the Patient; for as long as the excrement and urin were free from this purulent matter, so long his arm plentifully flowed therewith; this on the contrary being dry, much purulent matter was voided both by stool and urin. Another was, that as our whole body 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 Glass that is full of Wine be set under another that is filled with Water, you may see the Wine raise it self out of the lower vessel to the upper through the midst of the Water, and so the Water descends through the midst of the Wine, yet so, that they do not mix themselves, but the one take and possess the place of the other. If this may be done by Art, by things onely natural, and to be discerned by our eyes, what may be done 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 we may despair to be done in the like case? For doth not the laudable bloud flow to the guts, kidnies, spleen, bladder of the gall, by the impulse of Nature together with the excrements, which presently the parts themselves separate from their nutriment? Doth not milk from the breits flow sometimes forth of the wombs of women lately delivered? Yet that cannot be carried down thither, unless by the passages of the mamillary veins and arteries, which meet with the mouths of the vessels of the womb in the middle of the straight

An History.

An History

How the *pus* may flow from the wounded arm by the urin and excrements.

Lib de loc. affec. 6. cap. 4.

straight muscles of the *Epigastrium*. Therefore no marvel, if according to *Galen*, the *pus* unmixt with the blood flowing from the whole body by the veins and arteries into the kidnies and bladder, be cast forth together with the urin. These and the like things are done by Nature, not taught by any Counsel or Reason, but onely assisted by the strength of the segregating and expulsive faculty; and certainly we presently dissecting the dead body, observed that it all, as also all the bowels thereof, were free from inflammation and ulceration, neither was there any sign of impression of any purulent matter in any part thereof.

CHAP. L.

By what external causes the urin is suppress, and prognosticks concerning the suppression thereof.

Why the dislocation of a *Vertebra* of the loins may cause a suppression of urin.

Why the suppression of the urin becomes deadly.

A Fever following thereon helps the suppression of urin.

THere are also many external causes, through whose occasion the urin may be suppress; such are bathing and swimming in cold water; the too long continued application of Narcotick Medicins upon the Reins, *Perinæum*, and Share; the use of cold meats and drinks, and such other like. Moreover, the dislocation of some *Vertebra* of the loins to the inside, for that it presseth the nerves disseminated thence into the bladder; therefore it causeth a stupidity or numbness of the bladder. Whence it is, that it cannot perceive it self to be vellicated by the acrimony of the urin, and consequently it is not stirred up to the expulsion thereof. But from whatsoever cause the oppression of the urin proceeds, if it persevere for some days, death is to be feared, unless either a Fever which may consume the matter of the urin, or a Scouring or Flux, which may divert it, shall happen thereupon. For thus by stay it acquireth an acrid and venenate quality, which flowing by the veins readily infecteth the mass of blood, and carried to the brain, much molests it by reason of that similitude and sympathy of condition which the Bladder hath with the *Meninges*. But Nature, if prevalent, easily freeth it self from this danger by a manifest evacuation by stool, otherwise it must necessarily call as it were to its aid, a feverith heat, which may send the abounding matter of this serous humidity out through the skin, either by a sensible evacuation as by sweat; because sweat and urin have one common matter: or else disperse and breath it out by transpiration, which is an insensible excretion.

CHAP. LI.

Of bloudy Urin.

The differences.

Causes.

SOme piss pure blood, others mixt, and that either with urin, and then that which is expelled resembles the washing of flesh newly killed; or else with *pus* or matter, and that either alone or mixed with the urin. There may be divers causes of this symptom, as the too great quantity of blood gathered in the body, which by the suppression of the accustomed and periodical evacuation, by the Courses or Hemorrhoids, now turns its course to the reins and bladder: the fretting asunder of some vessel by an acrid humour, or the breaking thereof by carrying or lifting of some heavy burden, by leaping, falling from high, a great blow, the falling of some weight upon the loins, riding post too violently, the too immoderate use of venery, and lastly, from any kind of painful and more violent exercise, by a rough and sharp stone in the kidnies, by the weakness of the retentive faculty of the kidnies, by a wound of some of the parts belonging to the urin, by the too frequent use of diuretick and hot meats and medicins, or else of things in their whole nature contrary to the urinary parts; for by these and the like causes, the reins are oft-times so inflamed, that they necessarily impostumate, and at length the impostume being broken it turns into an ulcer, casting forth quitture by the urin. In so great variety of the causes of bloudy urin, we 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 mixt, and that either with the urin alone, or with *Pus*. For example, if this bloudy 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 propriety of the pain, and other things which have preceded, or are yet present. And we may gather the same by the plenty and quality; for if, for example, the *pus* flow from an ulcer of the arm, the purulent matter will flow by turns, one while by the urin, so that little is cast forth by the ulcer; then presently on the contrary the urin becomes more clear. That purulent matter which flows from the lungs by reason of an *Empyema*, or from the liver, or any other bowel placed above the midriff, the *pus* which is cast forth with the urin, is both in greater plenty and more exactly mixed with the urin than that which flows from the kidnies and bladder. It neither belongs to our purpose, or a Surgeons 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 be hoped for so long as the cause remains. And if this bloud flow by the opening of a vessel, it shall be staid by astringent medicins; if broken, by agglutinative; if corroded or fretted asunder, by sarcotick.

Signs of what causes they proceed.

Cure.

CHAP. LII.

Of the Signs of the ulcerated Kidnies.

I Had not determined to follow or particularly handle the causes of bloudy urins, yet because that which is occasioned by the ulcerated reins or bladder more frequently happens, 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 maxt with the urin, never evacuated by it self, but always flowing

forth

forth with the Urin, and residing in the bottom of the Chamber-pot, with a sanious and red sediment, fleshy and as it were bloudy fibres swimming up and down in the Urin, the smell of the filth is not so great as that which flows from the ulcerated bladder, for that the kidnies, seeing they are of a fleshy substance, do far better ripen and digest the purulent matter than the bladder which is nervous and bloudless. Why the matter which flows from the kidnies is less stinking than that which flows from the bladder.

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 therefrom, 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 come to make water, but in the very 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 making water, to wit, by reason of the pain caused by the Urin fretting of the ulcerated part in the passage by: neither is the matter seen mixed with the Urin, as is usual in an ulcer of the upper parts, because it is poured forth not together with the Urin, but after it.

CHAP. LIV.

Prognosticks of the ulcerated Reins and Bladder.

ULcers of the kidnies are more easily and readily healed than those of the bladder; for fleshy parts more speedily heal and knit than bloudless and nervous parts. Ulcers which are in the bottom of the bladder, are incurable, or certainly most difficult to heal; for besides that they are in a bloudless part, they are daily vellicated and exasperated by the continual afflux of the contained Urin, for all the Urin is never evacuated: now that which remains after making water, becomes more acrid by the distemper and heat of the part, for that the bladder is always gathered about it, and dilated and straitned according to the quantity of the contained Urin: therefore in the *Ischuria*, that is, the suppression or difficulty of making water, you may sometimes see a quart of water made at once. Those which have their legs fall away, having an ulcer in their bladder, are near their deaths. Ulcers arising in these parts, unless they be consolidated in a short time, remain uncurable. Why ulcers of the bladder are cured with more difficulty.

CHAP. LV.

What Cure must be used in the suppression of the Urin.

IN curing the suppression of the Urin, the indication must be taken from the nature of the disease, and cause thereof, if it be yet present or not. But the diversity of the parts by which being hurt, the *Ischuria* happens, intimates the variety of Medicins, neither must we presently run to diureticks, and things breaking the stone, which many Empericks do. For hence grievous and malign symptoms often arise, especially if this suppression proceed from an acrid humour, or bloud prested out by a bruise, immoderate venery, and also more vehement exercise, a hot and acrid potion, as of *Cantharides*, by too long abstaining from making water, by a *Phlegmon*, or ulcer of the urinary parts. For thus the pain and inflammation are increased, whence follows a gangrene, and at length death. Wherefore attempt nothing in this case without the advice of a Physician, no not when you must come to Surgery. For diureticks can scarce have place in another case, then when the urinary passages are obstructed by gravel, or a gross and viscid humour, or else in some cold Country, or in the application of Narcoticks to the loins, although we must not here use these before we have first made use of general Medicins: now Diureticks may be administred sundry ways, as hereafter shall appear. Scopes of curing. To what suppression of the urin diureticks must not be used. To which, and when to be used.

℞ *Agrimon. urtic. parietar. furculas rubras habentis, an.* m.j. *rad. asparag. mundat.* ʒ iv. *gran. alkekengi, nu.* xx. *sem. malvæ* ʒ ß. *rad. acor.* ʒ j. *bulliant omnia simul in sex libris aquæ dulcis ad tertias, deinde colentur.* Let the Patient take ʒ iv. hereof with ʒ j. of Sugar-candy, and drink it warm fasting in a morning, three hours before meat. Thirty or forty Ivy-berries beaten in white Wine, and given the Patient to drink some two hours before meat, are good for the same purpose. Also ʒ j. of nettle-seeds made into fine powder, and drunk in chicken-broth, is good for the same purpose. A decoction also of grummel, Goats-saxifrage, Pellitory of the Wall, white Saxifrage, the roots of Parsley, *asparagus, acorus, bruscus*, and Orris drunk in the quantity of some three or four ounces, is profitable also for the same purpose. Yet this following Water is commended above the rest to provoke Urin, and open the passages thereof, from what cause soever the stopping thereof proceeds. ℞ *Rad. osmund. regal. cyp. bismal. gram. petrosel. fœnic. an.* ʒ ij. *rasplo. crassior. in taleol.* ʒ iv. *macerentur per noctem in aceto albo acerrimo, bulliant postea in aquæ fluvialis* ℔ x. *saxifrag. crist. marin. rub. tinct. milii solis, summitat. malvæ bismal. an.* p. ij. *beryl. cicer. rub. an.* p. j. *sem. melon. citrul. an.* ʒ ij. ß. *alkekengi, gra.* xx. *glycyrrhiz.* ʒ j. *bulliant omnia simul ad tertias: in colatura infunde per noctem fol. sen. orientat.* ℔ ß. *fiat iterum parva ebullitio, in expressione colata infunde cinam. electi.* ʒ vj. *colentur, iterum colatura injiciatur in alembicum vitreum, postea terebenet. luc.* ℔ ij. *aquæ* ʒ vj. *agitentur omnia simul diligentissime. Lutetur alembicum luto sapientiæ, fiat distillatio lento igne in balneo Mariæ.* Use it after the following manner: ℞ *Aq. stillatitiæ scriptæ* ʒ ij. *aut* iij. According to the operation which it shall perform, let the Patient take it four hours before meat. A diuretick Water.

Also

Why the use of diureticks is better after bathing.

To cleanse the ulcers of the Kidnies and Bladder.

Also Radish-water distilled in *balneo Mariæ* is given in the quantity of ʒ iv. with sugar, and that with good success. Baths and *Semicupia*, or half-baths are artificially made, relax, soften, dilate, and open all the body; therefore the prescribed Diureticks mixed with half a dram of Treacle may be fitly given at the going forth of the Bath. These Medicins following are judged fit to cleanse the ulcers of the Kidnies and Bladder. Syrup of Maiden-hair, of Roses, taken in quantity of ʒ j. with *hydromel*, or barley-water: Asses or Goats milk are also much commended in this affect, because they cleanse the ulcers by their serous or whayish portion, and agglutinate by their Cheese-like. They must be taken warm from the dug, with honey of Roses or a little salt, lest they corrupt in the stomach; and that to the quantity of four ounces, drinking or eating nothing presently upon it.

Trochisces to heal the ulcers of the Kidnies.

The following Trochisces are also good for the same purpose. ℞ *Quatuor sem. frigid. major. seminis papaveris albi, portulacæ plantag. cydon, myrtil. gum. tragacanth. & arab. pinear. glycyrrh. mund. hordei mund. mucilag. pfilii, amygdal. dulcium an.* ʒ j. *boli armen. sanguin. dracon. sphdii, rosar. mastich. terræ sigil. myrrhæ, an.* ʒ ij. *cum oxymelite, conficiantur secundum artem trochisci.* Let the Patient take ʒ ß. dissolved in Whay, Ptisan, Barly-water, and the like; they may also be profitably dissolved in Plantain-water, and injected into the bladder.

Drink in stead of Wine.

Let the Patient abstain from Wine, and in stead thereof let him use Barley-water or *hydromel*, or a Ptisan made of an ounce of Raisins of the Sun, stoned and boiled in five pints of fair water, in an earthen Pipkin well leaded, or in a Glass, until one pint be consumed, adding thereto of licorice scraped and beaten ʒ j. of the cold seeds likewise beaten two drams. Let it after it hath boiled a little more, be strained through an Hypocras bag, with a quartern of Sugar, and two drams of choice Cinamon added thereto, and so let it be kept for usual drink.

CHAP. LVI.

Of the Diabete, *or inability to hold the Urin.*

What *Diabete* is.

The Causes.

THe *Diabete* is a Disease, wherein presently after one hath drunk, the Urin is presently made in great plenty, by the dissolution of the retentive faculty of the reins, and the depravation or immoderation of the attractive faculty. 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.

Signs.

This affect must be diligently distinguished from the excretion of the morbifick causes by Urin. The loins in this disease are molested with a pricking and biting pain, and there is a continual and unquenchable thirst: and although this disease proceed from a hot distemper, yet the Urin is not coloured, red, troubled, or thick, but thin, and white or waterish, by reason the matter thereof makes very small stay in the Stomach, Liver, and hollow Vein, being presently drawn away by the heat of the Kidnies or Bladder.

Why the Urins are waterish.

If the affect long endure, the Patient for want of nourishment falleth away, whence certain death ensues.

The Cure.

For the cure of so great a disease, the matter must be purged, which causes or feeds the inflammation or *phlegmon*, and consequently bloud must be let. We must abstain from the four cold seeds, for although they may profit by their first quality, yet will they hurt by their diuretick faculty. Refrigerating and astringent nourishments must be used, and such as generate gross humours; as Rice, thick and astringent wine mixed with much water.

Narcotick things to be applied to the loins.

Exceeding cold, yea narcotick things shall be applied to the loins, for otherwise by reason of the thickness of the muscles of those parts, the force, unless of exceeding refrigerating things, will not be able to arrive at the reins; of this kind are Oil of white Poppy, Henbane, *Opium*, Purslain, and Lettuce-seed, Mandrage, Vinegar, and the like: of which Cataplasms, Plasters, and Ointments, may be made fit t corroborate the parts, and correct and heat.

CHAP. LVII.

Of the Strangury.

What the Strangury is.

THe Strangury is an affect having some affinity with the *Diabete*, as that wherein the water is involuntarily made, but not together at once, but by drops, continually and with pain.

The Causes.

The external causes of a Strangury are, the too abundant drinking of cold water, and all too long stay in a cold place. The internal causes are, the defluxion of cold humours into the Uriniary parts; for hence they are resolved by a certain palsie, and the *sphincter* of the bladder is relaxed, so that he cannot hold his water according to his desire: inflammation also and all distemper causeth this affect, and whatsoever in some sort obstructs the passage of the Urin; as clotted bloud, thick phlegm, gravel, and the like. And because, according to *Galens* opinion, all sorts of distemper may cause this disease, divers Medicins shall be appointed according to the difference of the distemper.

Com. ad aphor. 15. sect. 3.

Therefore against a cold distemper fomentations shall be provided of a decoction of Mallows, Roses, *Origanum*, Calamint, and the like, and so applied to the Privities: then presently after, let them be anointed with Oil of Bays, and of *Castoreum*, and the like. Strong and pure Wine shall be prescribed for his drink, and that not only in this cause, but also when the Strangury happens by the occasion of obstruction, caused by a gross and cold humour, if so be that the body be not plethorick. But if inflammation, together with a *Plethora* or fulness, hath caused this affect, we may, according to *Galens* advice, heal it by bloud-letting.

Ad aphor. 48. sect. 7.

But if obstruction be in fault, that shall be taken away by Diureticks either hot or cold, according to the condition of the matter obstructing. We here omit to speak of the *Dysuria*, or difficulty of making water, because the remedies are in general the same with those which are used in the *Ischuria*, or suppression of Urin.

CHAP.

CHAP. LVIII.

Of the Colick.

WHenſoever the guts being obſtructed, or otherwiſe affected, the excrements are hindred from paſſing forth, and if the fault be in the ſmall guts, the affect is termed *Volvulus*, *Ileos*, and *Miſerere mei*; but if it be in the greater guts, it is called the Colick, from the part affected, which is the *Colon*, that is, the continuity 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 defines 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 groſſneſs 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 biting humors. Now we will treat of each of theſe in particular. Almoſt the ſame cauſes produce the groſſneſs 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 nourihment, if ſundry thereof, and of ſundry kinds be eaten at the ſame meal, and in greater quantity then is fit. For hence crudity and obſtruction, and at length the collection of flatulencies, whereon a tenſive pain enſues. This kind of Colick is alſo cauſed by the uſe of crude fruits, and too cold drink, drunken eſpecially when any is too hot by exerciſe, or any 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 kidneys, happens by the ſympathy of the reins pained or troubled with the ſtone or gravel contained in them or the ureters. Therefore then alſo pain troubles the Patient at his hips and loins, becauſe the nerves, which ariſing from the *vertebræ* of the loins, are oppreſſed by the weight of the ſtones and gravel, about the joynt of the hip are diſſeminated into the muſcles of the loins and thigh. Alſo the ureter are pained (for they ſeem nothing elſe but certain hollow nerves) and alſo the cremaſter muſcles, ſo that the Patients teſticles may ſeem to be drawn upwards with much violence. Hence great phlegmatick, and cholerick vomiting, and ſweat of the whole body, all which do not ſurceaſe before that the ſtone or gravel ſhall be forced down into the bladder. Now vomiting happens in this affect, for that the ventricle by reaſon of its continuity and neighbourhood which it hath with the guts, ſuffers by conſent or ſympathy. For the ſtomach is of the ſame kind or matter as the guts are, ſo that the guts ſeem nothing elſe but a certain production of the ſtomach. Therefore if at any time Nature endeavour to expel any thing that is troubleſome in the kidneys, ureters, coats of the guts, meſentery, *pancreas*, and hypocondries, it cauſeth a Colick with pain and vomiting. An hot and dry diſtemper alſo cauſeth the Colick, prducing a pricking and biting 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 lubricating of the guts. Acrid, viſcid and tough phlegm cauſeth the ſame. There is alſo another cauſe of the Colick which is not ſo common; to wit, the twining of the guts, that is, when they are ſo twined, folded, and doubled, that the excrements, as it were, bound in their knots, cannot be expelled, as it manifeſtly happens in the rupture called *Enterocele*, by the falling of the guts into the cod: Likewiſe alſo Worms generated in the Colick-gut, whilſt that they mutually fold or twine themſelves 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 dry body of the Patient, or by his diet, that is, the uſe of too dry meats, or exerciſes and pains taken in the heat of the Sun, or by the greatneſs of buſineſs, the mind being carried away, cauſeth the Colick, with Head-ach, and plenty of vapors flying upwards.

What *Ileus*, or *illaca 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 cauſe of the colick.

I remember I once diſſected the body of a Boy of ſome twelve years old, who had his guts folded with many, as it were, ties or knots of the reſtrained, too hard and dry excrements, the which he caſt out by his mouth a little before his death, which brought him to his end, being 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 judge it not amiſs here 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 kidneys; 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 caſteth forth by ſtone or urine, for that the great and laborious endeavour of Nature to caſt forth the ſtone which is in the Kidneys, is propagated by a certain ſympathy and like ſtudy of the neighbouring 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 belly. The force of the ſhut-up wind is ſometimes ſo great, that it rendeth or teareth the guts in ſunder, no otherwiſe than a Swines bladder too hard blown up: Which when it happens, the Patient dies with much vomiting, becauſe the ſtomach oppreſt with wind, can contain nor imbrace no meat. The Colick which is occaſioned by the too long keeping in of the excrements, is accompanied with the weight and pain of the belly, the tenſion of the guts, head-arch, apparent hardneſs of the belly, and the complaint of the Patient that he hath not gone to ſtool in a long time. That which proceeds from a cholerick inflammation, yields a ſenſe of great heat and pulſation in the midſt of the belly, 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 ſundry times is aſſociated with a difficulty of making wa-

An Hiſtory.

Signs whereby we know that the colick proceeds from this or that cauſe.

ter, for that when as the right gut is inflamed, the bladder is preſſed by reaſon of their ſocicty or neighbourhood. The Colick which proceeds from the conuſion of the guts, ſhews it ſelf by the exceſſive cruelty of the pain ariſing, for that the guts are not in their due ſite and place, and becauſe the excrements by their too long detention acquire a preternatural heat; and this is the cauſe of the death of many ſuch as have ruptures, for that the gut falling down from the natural place into the cod, being a preternatural place, is redoubled, and kept there, as it were, bound, whereby the excrements being baked, becoming more acridly hot, cauſe inflammation, and by raiſing up flatulencies, increaſe the diſtenſion through all the guts, until at length a deadly *Ileos* or colick ariſing, they come forth at the mouth. For prognoſticks, it is better to have the pain in the colick to wander up and down, than to be fixed: It is good alſo that the excrements are not wholly ſuppreſt. But the evil ſigns that are here, pronounce the affect either difficult or deadly. Now theſe ſhew that it is deadly, intolerable tormenting pain, continual vomiting, cold ſweat, coldneſs of the extreme parts, hicketing by reaſon of the ſympathy the ſtomach 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 nerves. But ſuch as have griping and pain about their navil and loins, which can neither be helped by medicine nor otherwiſe, it ends in a Dropſie. The cure muſt be diverſified according to the variety of the cauſes, for the Stone-colick is cured by medicines proper to the ſtone; that which is cauſed by an *Enterocele*, is cured by the only reſtoring the gut to its place; that which is occaſioned by Worms, requires medicines fit to kill and caſt forth the Worms. But that which proceeds from the weakneſs and refrigeration of the guts and ſtomach, is cured by heating and ſtrengthning medicines as well applied outwardly, as taken inwardly by the mouth, or otherways. 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 dejects the powers than pain. To this purpoſe ſhall you provide Baths, *Semicupia*, fomentations of Mallows, Marſh-mallows, Violet leaves, Peny-royal, Fennel, *Origanum*, the ſeeds of Thyme and Fenugreek, flowers of Camomil, Melilote, and other ſuch like, which have power to heat, dry, attenuate and rarifie the skin, ſo to diſſipate the wind. But all muſt be actually hot. Alſo the belly may be anointed with this following oyntment. ℞ *Olei chamæm. anethi. butyr. recent. an.* ℥ i. *ſem. apii, petroſ. & galang. an.* ʒ ß. *Aq. vitæ, ol. ſalviæ aut Thymi chimici extract. q. ſ.* The following liniment is much commended by *Holerus*. ℞ *Olei. rut. & nardi an.* ʒ vi. *Galbani cum aq. vit. diſſoluti* ʒ ii. *Liquefactis ſimul adde zibetæ gr.* iiij. *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 be applied hot upon the belly and flanks, and renewed before they grow cold. You may, inſtead of theſe bags, uſe Ox-bladders half filled with a decoction of reſolving things; as Salt, Roſemary, Thyme, Lavender, Bay-berries, and the like: Then inject a Clyſter being thus made. ℞ *Quatuor emol. an.* m.i. *orig. puleg. calamenth. an.* m. ß. *aniſi, carui an.* m. ß. *Flor. anethi. an.* p.i. *bulliant in hydromele ad* lb i. *in qua diſſolve bened. laxat. mellis anthoſati, ſacc. rub. an.* ℥ i. *Olei anethi. & chamæm. an.* ℥ i ß. Let a clyſter be made to be injected at twice; for the guts being ſtretched out cannot contain the accuſtomed doſis of a clyſter; Alſo this following clyſter is much approved. ℞ *Vini malvat. & olei nucum an.* ℥ iij. *Aq. vitæ,* ʒ i. *Olei juniperi. & rut. per quintum eſſent extract. an.* ʒ iij. Let this be injected as hot as the Patient can endure. I have oft-times, as by miracle, helped intolerable pain cauſed by the Wind-colick and Phlegm with this clyſter. *Avicen* preſcribes a carminative clyſter made of Hyſſop, *Origanum acetus*, 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 Muſcadine, or Hypocraſs made with good Wine, ſo to heat the ſtomach and guts. For in *Galen*'s opinion, all windineſs is generated by a remiſs heat. But if the pain ſhall continue, a large Cupping-glaſs ſhall be applied to the navel, to draw and diſſipate the windineſs; the belly ſhall be bound with ſtrong and broad ligatures, to ſtrengthen the guts, and diſcuſs the matter of flatulencies. The Patients taught by Nature to uſe this remedy, whilſt none admoniſhing them, they preſs the belly with their hands in the bitterneſs of pain. But if the pain cannot be thus appeaſed, we muſt come to ſuch medicines as work by an occult property, as the dried gut of a Wolf, for a dram thereof made into powder is given in Wine with good ſucceſs. That Colick which is cauſed by a cholerick inflammation requires contrary medicines, to wit, blood-letting, and a refrigerating diet; potions made of *Diacatholicon* and *Caſſia* diſſolved in Barley-water, alſo cooling clyſters. *Avicen* preſcribes narcoticks, for that being cold, they are contrary to the morbifick cauſe which is hot and dry; ſuch are pills of *Philonium*. Alſo pills of *Hiera picra* in the quantity of ʒ iv. with *Opium* and Saffron, of each one grain, may be uſed. Alſo Baths are appointed, made of water wherein Mallows, Marſh-mallows, Violet leaves, flowers of white Lilies, Lettuce, Purſlan have been boiled, to correct the acrimony of the cholerick and hot humors, whence the diſeaſe and ſymptom ariſeth. That Colick which is like to this, and proceeds from ſalt, acrid, thick and tough phlegm, is cured, the humor being 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* cures that which is occaſioned by the ſuppreſſion of the hardned excrements, and twining of them by meats which have an emollient faculty, 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, Polypody, and a little Salt, until the fleſh fall from the bones; alſo he uſeth detergent clyſters, ſuch as this which follows. ℞ *Betæ,* m.i *Furfuris,* p. i. *ficus,* nu. x. *alth.* m.i. *Fiat decoctio ad* lb i. *In qua diſſolve nitri & mutiæ an.* ʒ ii. *Sacc.* ℥ i. *Ol. ſeſamini,* ʒ ij. But if the obſtruction be more contumacious, you muſt uſe more powerful ones made *ex cyclamin. centaurio, & hiera diacolocinth. an.* ʒ ij. But if the obſtruction do notwithſtanding remain, ſo that the excrements come forth at the mouth, *Marianus Sanctus* witheth (by the counſel of many who have ſo freed themſelves from this deadly ſymptom) to drink three pounds of Quick-ſilver with water only. For the doubled, and, as it were, twined up-gut is unfolded by the weight of the Quick-ſilver, and the excrements are depreſt and thruſt forth; and

Aviten. lib. 3. *Hip. aphor.* 10. *ſect.* 4.

The cure.

Baths and anodine fomentations.

An ointment.

Why clyſters in the Colick muſt be given in leſs quantity.

Specifick medicines.

The cure of a cholerick colick.

The force of quick-ſilver in the unfolding of the guts.

and the Worms are killed which gave occasion to this affect. *John* of S. *Germans*, that most worthy Apothecary, hath told me that he saw a Gentleman, who when as he could not be freed from the pain of the colick by any means prescribed by learned Physicians, at length by the counsel of a certain German his Friend, drank three ounces of oyl of Sweet-almonds drawn without fire, and mixed with some White-wine and Pellitory-water, and swallowed a leaden Bullet besmeared with Quick-silver, and that Bullet coming presently out by his fundament, he was wholly freed from his colick.

CHAP. LIX.

Of Phlebotomy, or Blood-letting.

PHlebotomy is the opening of a vein, evacuating the blood with the rest of the humors; thus Arteritomy, is the opening of an artery. The first scope of Phlebotomy is the evacuation of the blood offending in quantity, although oft-times the Physicians intention is to draw forth the blood which offends in quality, or either way by opening a vein. Repletion, which is caused by the quantity, is two-fold; the one *ad vires*, that is, to the strength, the veins being otherwise not very much swelled: This makes men infirm and weak, Nature not able to bear his humor, of what kind soever it be. The other is termed *ad vasa*, that is, to the vessels, the which is so called comparatively to the plenty of blood, although the strength may very well away therewith. The vessels are oft-times broke by this kind of repletion, so that the Patient casts and spits up blood, or else evacuates it by the nose, womb, hemorrhoids, or *varices*. The repletion which is *ad vires*, is known by the heavinesse and wearisomnesse of the whole body; but that which is *ad vasa*, is perceived by their distension and fulnesse, both of them stand in need of evacuation. But blood is only to be let by opening a vein, for five respects: The first is to lessen the abundance of blood, as in plethorick bodies, and those who are troubled with inflammation without any 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 quality; as when in sharp feavers we open a vein to breathe out that blood which is heated in the vessels, and cooling the residue which remains behind. The fifth is to prevent imminent diseases; as when in the Spring and Autumn we draw blood by opening a vein in such as are subject to spitting of blood, the Squinancy, Plurisie, Falling-sickness, Apoplexy, Madness, Gout, or in such as are wounded, for to prevent the inflammation which is to be feared. Before blood-letting, if there be any old excrements in the guts, they shall be evacuated by a gentle Clyster or suppository, lest the mesaraick veins should thence draw unto them any impurity. Blood must not be drawn from ancient people, unless some present necessity require it, lest the native heat, which is but languid in them, should be brought to extreme debility, and their substance decay; neither must any in like sort be taken from children, for fear of resolving their powers by reason of the tenderness of their substance, and rareness of their habit. The quantity of blood which is to be let, must be considered by the strength of the Patient and greatness of the disease: Therefore if the Patient be weak, and the disease require large evacuation, it will be convenient to part the letting of blood, yea by the interposition of some days. The vein of the forehead being opened is good for the pain of the hind-part of the head, yet first we foment the part with warm water, that so the skin may be softer, and the blood drawn into the veins in greater plenty. In the Squinancy, the veins which are under the tongue must be opened astant, without putting any ligatures about the neck, for fear of strangling. Phlebotomy is necessary in all diseases which stop or hinder the breathing, or take away the voice or speech; as likewise in all contusions by a heavy stroke, or fall from high, in an Apoplexy, Squinancy, and Burning-feaver, though the strength be not great, nor the blood faulty in quantity or quality, blood must not be let in the height of a Feaver. Most judge it fit to draw blood from the veins most remote from the affected and inflamed part, for that thus the course of the humors may be diverted, the next veins on the contrary being opened, the humors may be the more drawn into the affected part, and so increase the burthen and pain. But this opinion of theirs is very erroneous, for an opened vein always evacuates and burthens the next part. For I have sundry times opened the veins and arteries of the affected part, as of the hands and feet in the Gout of their parts; of the temples in the Megrim; whereupon the pain always was somewhat asswaged, for that together with the evacuated blood, the malignity of the Gout, and the hot spirits (the causes of the Head-ach or Megrim) were evacuated. For thus *Galen* wilheth to open the arteries of the temples in a great and contumacious defluxion falling upon the eyes, or in the Megrim or Head-ach.

What Phlebotomy is.

The use.

Repletion two-fold.

The signs.

Five scopes in letting blood.

From whence we must not draw blood.

When and for what it is necessary.

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 he be 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:

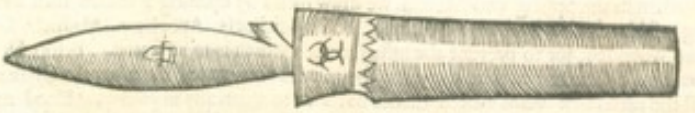
Rubbing the arm. Binding it before we open the vein.

Then he ſhall bind the vein with a ligature a little above the place appointed to be opened, and he ſhall draw back the blood upwards towards the ligature from the lower part; and if it be the right arm, he 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 were you mean to open it, leſt it ſhould ſlip away; and that it may be the more ſwoln by forcing up the blood: Then with with his nail he ſhall mark or deſign the place to be opened, and ſhall anoint it, being ſo marked, with butter or oyl, whereby the ſkin may be relaxed, and the lancet enter more eaſily, and therefore the ſection may be the leſs painful. He ſhall hold his lancet between his thumb and fore-finger, neither too near, nor too far from the point; he ſhall reſt his other three fingers upon the Patients arm, that ſo his hand may be the more ſteddy, and leſs trembling. Then ſhall he open the vein with an Inciſion agreeable to the magnitude of the veſſel, and the indifferent thickneſs of the contained blood, ſomewhat aſlant, diligently avoiding the artery which lies under the *Baſilica*, and the nerve or tendon of the two-headed muſcle, which lies under the Median vein. But for the Cephalick, it may be opened without danger. As much blood as is ſufficient being drawn, according to the mind of the Phyſician, he ſhall looſe the ligature, and laying a little boulſter under, he ſhall with a ligature bind up the wounded part to ſtay the bleeding, the ligature ſhall be neither too ſtrait nor looſe, but ſo that the Patient may freely bend and extend his arm; wherefore whilſt that is in doing, he muſt not hold his arm ſtrait out, but gently bended, otherwiſe he cannot freely bend it.

Why the *Baſilica* and Median may not be opened ſo ſafely as the Cephalick.

The binding up after blood-letting.

The Figure of a Lancet to let blood withal.



CHAP. LXI.

Of Cupping-glaſſes or Ventoſes.

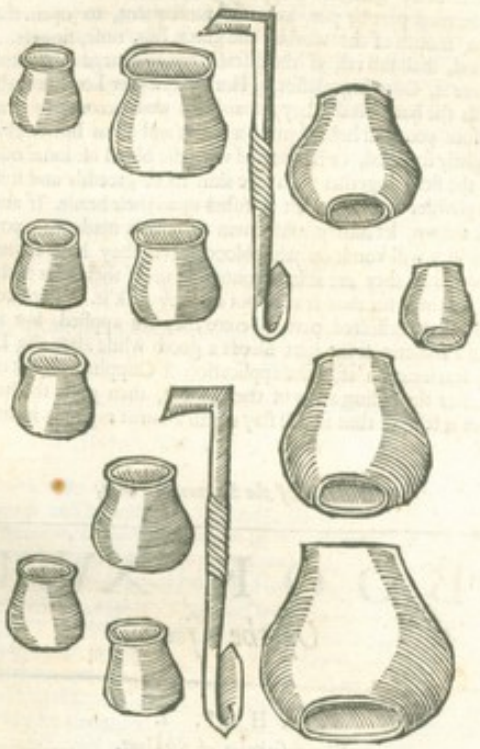
The uſe of Cupping-glaſſes.

CUpping glaſſes are applied eſpecially when the matter conjunct and impact in any part is to be 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 flows down into the eyes, they may be applied to the ſhoulders with a great flame, for ſo they draw more ſtrongly and effectually. They are alſo applied under womens 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 poyſon from within outwards. For (as *Celſus* ſaith) a Cupping glaſs where it is faſtned on, if the skin be firſt ſcarified, draws forth blood; but if it be whole, then it draws ſpirit. Alſo they are applied to the belly, when any groſs or thick windineſs ſhut up in the guts, or membranes of the *Epigaſtrium*, or lower belly cauſing the colick, is to be diſcuſſed. Alſo they are faſtned to the *Hypocondries*, when as flatulency in the liver, or ſpleen, ſwells up the entrail lying thereunder, or in too great a bleeding at the noſe. Alſo they are ſet againſt the reins in the bottom of the belly, whereas the ureters run down to draw down the ſtone into the bladder, when as it ſtops 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 greatneſs be applied, you may fit horns for the ſame purpoſe.

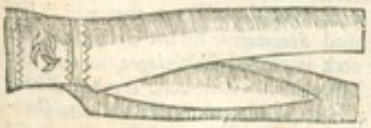
Lib. 8. cap. 1.

The

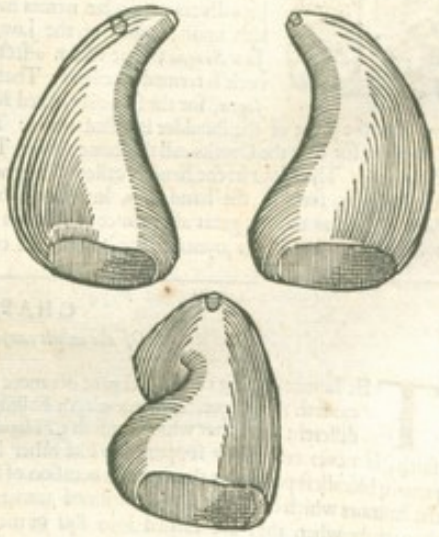
The Figures of Cupping-glasses of different bigness, with little holes in their bottoms, which shall be stopped with wax, when you apply them to the parts; but opened when you would take them off, that so the air may enter in with the more ease.



A Lancet.



Horns which without fire, by only sucking at the upper holes draw from the part lying under them.



CHAP. LXII.

Of Leeches, and their use.

The use of Leeches.

IN those parts of the body whereto Cupping-glasses and horns cannot be applied, to those Leeches may for the most part be 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 Leeches being filled with blood, shall fall off, if the disease require a large evacuation of blood, and the part affected may endure it, Cupping-glasses, or Horns, or other Leeches shall be substituted. If the Leeches be handled with the bare hand, they are angred, and become so stomachful, as that they will not bite; wherefore you shall hold them in a white and clean linnen cloth, and apply them to the skin, being first lightly scarified, or besmeared with the blood of some other creature; for thus they will take hold of the flesh, together with the skin more greedily and fully. To cause them fall off, you shall put some powder of Aloes, Salt or Ashes upon their heads. If any desire to know how much blood they have drawn, let him sprinkle them with Salt made into powder, as soon as they are come off; for thus they will vomit up what blood soever they have sucked. If you desire they should suck more blood than they are able to contain, cut off their tails as they suck, for thus they will make no end of sucking, for that it runs out as they suck it. The Leeches by sucking, draw the blood not only from the affected part whereto they are applied, but also from the adjacent and distant parts. Also sometimes the part bleeds a good while after the Leeches be fallen away, which happens 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 press the half of a Bean upon the wound, until it stick of it self, for thus it will stay; also a burnt rag may be fitly applied with a boulster and fit ligature.

How to apply them.

How to cause them to fall off.

The end of the Seventeenth Book.

BOOK XVIII.

Of the Gout.

CHAP. I.

The description of the Gout.

What it is.

THE Gout is a disease occupying and harming the substance of the joynts by the falling down and collection of a virulent matter accompanied by four humors. This word *Arthritis* or Gout, is general for every joint so affected; yet it enjoys divers particular names in sundry joynts of the body; as that which falleth upon the joint of the Jaw, is termed *Siagonagra*, for the Greeks call the Jaw *Siagon*; that which affects the neck is termed *Trachelagra*, for that the neck is termed *Trachelos*: That which troubles the back-bone is called *Rhacisagra*, for the spine is termed *Rhacis*: That which molests the shoulders *Omagra*, for the joynt of the shoulder is called *Omos*: That which affects the joynt of the collar-bones *Cleisagra*, for that the Greeks call this bone *Cleis*: That in the elbow *Pechysagra*, 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*, *Gonia* and *Pous*. When as there is great abundance of humors in a body, and the Patient leads a sedentary life, not some one, but all the joynts of the body are at once troubled with the Gout.

Particular Gouts.

CHAP. II.

Of the occult causes of the Gout.

Lib.12.cap.12.

THE humor causing the Gout is not of a more known, or easily expresst nature than that which causeth the plague, *Lues venerea*, or Falling sickness. For it is of a kind and nature clean different from that which causeth a *Phlegmon*, *Oedema*, *Erysipelas*, or *Scirrhus*; for as *Aetius* saith, it never cometh to suppuration like other humors, not for that, as I think, because it happens in bloodless parts, but through the occasion of some occult malignity. Hereto may be added, that the humors which cause the fore-mentioned tumors, when as they fall down upon any part, not then truly when they are turned into *Pus* or matter, do they cause so sharp pains as that which causeth the Gout, for the pain thereof is far more sharp, than of that humor which causeth an ulcerated *Cancer*. Besides these humors, when they fall upon the joynts through any other occasion, never turn into knots, only that which causeth the Gout in the joynts, after it hath fallen thither, is at length hardned into a certain knotty, and, as it were, plaster-like substance to be amended by no remedies. But seeing it offends not the parts by which it flows down (no more than the matter which creeping upwards from the lower parts to the brain, causeth the *Epilepsie*) as soon as it falleth into spaces of the joynts, it causeth cruel pain, one while with heat, another while with cold. For

The resemblance of the Gout or the Epilepsie.

For you may see some troubled with the Gout, who complain that their pained joynts are burnt; there are others to whom they seem colder than any ice, so that they cannot be sufficiently heated to their hearts desire; verily you may sometimes see in the same body troubled with the Gout, that the joynts of the right side will, as it were, burn with heat, but on the left side will be stiff with cold; or which is more, the knee in the same side to be tormented with a hot distemper, and the ankle troubled with a cold. Lastly, there sometimes happens a succession of pain in a succession of days, as the same joynts will be this day troubled with a hot, to morrow with a cold distemper, so that we need not marvel to see Physicians prescribe one while hot, another while cold medicines against the same disease of the same part and body. Also it sometimes happens that the malignity of this humor doth not only not yield to medicines, but it is rather made worse, so that the Patients affirm that they are far better when they have none, than when they have any remedies applied. For all things being rightly done, and according to reason, yet the disease will come again at certain seasons by fits; and hereupon it is said by *Horace*:

The strange variety of the Gout.

Qui cupit, aut metuit, juvat illum sic domus aut res,
Ut lippum pictæ tabulæ, fomenta podagram.

Riches the covetous, and fearful so do please,
As Pictures sore eyes, Bathes the Gout do ease.

Certainly such as have this disease hereditarily, can no more be helped and throughly freed therefrom, than those in whom the matter of the disease is become knotty, whereof *Ovid* thus speaketh:

Tollere nodosam nescit medicina podagram.

Physick the knotty Gout it cannot heal.

These reasons have induced many to believe, that the essence of this disease is unknown, for there is a certain occult and inexplicable virulency, the author of so great malignity and contumacy; which *Avicen* seems to acknowledge, when he writes that there is a certain kind of Gout whose matter is so acute and malign, that if it at any time be augmented by the force of anger, it may suffice to kill the party by sudden death. Therefore *Galen* himself writes that Treacle must be used in all Arthritical and gouty affects, and as I think for no other reason, than for that it dries, wastes, and weakens the malignity thereof. *Gordonius* is of the same opinion, but addeth withal, that the body must be prepared and purged before we use Treacle. Therefore the matter of the Gout is a thin and virulent humor, yet not contagious, offending in quality rather than quantity, causing extreme pains, and therefore instigating the humors together with the caliginous and flatulent spirits prepared or ready for defluxion upon the affected parts. Therefore as the bitings of Asps, and stingings of Wasps cause cruel pain with sudden swelling and blistering, which is by the heat of the humors which the poyson hath tainted, and not by the simple solution of continuity, seeing that we daily see Shoo-makers and Taylors pricking their flesh with awls and needles, without having any such symptom: So the virulency of the Gout causeth intolerable tormenting pain, not by the abundance, because it happens to many who have the Gout, no sign of defluxion appearing in the joynts, but only by a malignant and inexplicable quality, by reason whereof these pains do not cease 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 malignity of the matter causing the Gout.

Lib. 3. fell. 2. tract. 2. cap.

Lib. de ther. ad Pisonem. c. 15.

The matter of the Gout partakes of occult malignity.

An History.

Whilst King *Charles* the ninth of happy memory, was at *Burdeaux*, there was brought to *Chappellain* and *Castellan* the Kings Physicians, and *Tate* a Physician of *Burdeaux*, *Nicolas Lambert* and my self, Surgeons, a certain Gentlewoman some forty years old, exceedingly troubled for many years, by reason of a tumor scarce equalling the bigness of a Pease, on the outside of the joynt of the left hip: One of her tormenting fits took her in my presence; she presently began to cry and roar, and rashly and violently to throw her body this way and that way, with motions and gestures above a womans, yea a mans nature; for she thrust her head between her legs, laid her feet upon her shoulders; you would have said she had been possessed of the Devil. This fit held her some quarter of an hour; during all which time I heedfully observed whether the grieved part swelled any bigger than it was accustomed, whether there hapned any new inflammation; but there was no alteration as far as I could gather by sight or feeling, but only that she cried out more loudly when as I touched it. The fit passed, a great heat took her, all her body ran down with sweat, with so great weariness and weakness of all her members, that she could not so much as stir her little finger. There could be no suspicion of an Epileptick, for this woman all the time of her agony did perfectly make use of all her senses, did speak, discourse, and had no convulsion. Neither did she spare any cost or diligence, whereby she might be cured of her disease by the help of Physicians or famous Surgeons; she consulted also with Witches, Wizzards, and Charmers, so that she had left nothing unattempted, but all art was exceeded by the greatness of the disease. When I had shewed all these things at our consultation, we all with one consent were of this opinion, to apply a potential Cautery to the grieved part, or the tumor. I my self applied it; after the fall of the Eschar very black and virulent *sanies* flowed out, which freed the woman of her pain and disease for ever after. Whence you may gather, that the cause of so great evil was a certain venenate malignity, hurting rather by an inexplicable quality than quantity; which being overcome and evacuated by the Cautery, all pain absolutely ceased. Upon the like occasion, but on the right arm, the wife of the Queens Coach-man at *Amboise*, consulted *Chappellain*, *Castellan* and me, earnestly craving ease of her pain, for she was so grievously tormented by fits, that through impatiency, being careless of her self, she endeavoured to cast her self headlong out of her chamber window,

A terrible fit.

How an Epileptick fit differs from the Gout.

for

for fear whereof ſhe had a guard put upon her. We judged that the like Monſter, was to be aſſaulted with the like weapon, neither were we deceived, for uſing a potential Cautery, this had like ſucceſs as the former. Wherefore the bitterneſs of the pain of the Gout is not occaſioned by the only weakneſs of the joynts, for thus the pain ſhould be continual, and always like it ſelf; neither is it from the diſtemper of a ſimple humor, for no ſuch thing happens in other tumors of what kind ſoever they be; but it proceeds from a venenate, malign, occult and inexplicable quality of the matter: Wherefore this diſeaſe ſtands in need of a diligent Phyſician, and a painful Surgeon.

CHAP. III.

Of the manifeſt cauſes of the Gout.

The firſt primitive cauſe of the Gout.

Although theſe things may be true which we have delivered of the occult cauſe of the Gout, yet there be and are vulgarly aſſigned others, of which a probable reaſon may be rendred, wherein this malignity, whereof we have ſpoke, lies hid and is ſeated. Therefore as of many 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 mothers womb, which happens to ſuch as are generated of gouty Parents, chiefly if whilſt they were conceived, this gouty matter did actually abound and fall upon the joynts. For the ſeed falls from all the parts of the body, as ſaith *Hippocrates*, and *Ariſtotle* affirms *lib. de gen. animal.* Yet this cauſes not an inevitable neceſſity of having the Gout, for as many begot of ſound and healthful Parents are taken by the Gout by their proper and primary default; ſo many live free from this diſeaſe, whoſe fathers notwithſtanding were troubled therewith. It is probable that they have this benefit and privilege by the goodneſs of their Mothers 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 diſeaſe would become hereditary, and gouty perſons would neceſſarily generate gouty; for the ſeed followeth the temper and complexion of the party generating, as it is ſhewed by *Avicen.* Another primitive cauſe is from inordinate diet, eſpecially in the uſe of meat, drink, exerciſe and venery. Laſtly, by unprofitable humors which are generated and heaped up in the body, which in proceſs of time acquire a virulent malignity; for theſe fill the head with vapors raiſed up from them, when the membranes, nerves and tendons, and conſequently the joynts become more lax and weak. They offend in feeding who eat much meat, and of ſundry kinds at the ſame meal, who drink ſtrong Wine without any mixture, who ſleep preſently after meat, and which uſe not moderate exerciſes; for hence a plentitude, an obſtruction of the veſſels, crudities, the increaſe of excrements, eſpecially ſerous: Which if they flow down unto the joynts, without doubt they cauſe this diſeaſe; for the joynts are weak either by nature or accident, in compariſon of the other parts of the body: By nature, as if they be looſe and ſoft from their firſt original; by accident, as by a blow, fall, hard travelling, running in the Sun by day, in the cold by night, racking, too frequent venery, 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 many crude humors, which by an unſeaſonable motion are ſent into the ſinews and joynts. Through this occaſion old men, becauſe their native heat is the more weak, are commonly troubled with the Gout. Beſides alſo the ſuppreſſion of excrements accuſtomed to be avoided at certain times, as the courſes, hemorrhoids, vomit, ſcouring, cauſeth this diſeaſe. 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 running ulcers ſuddenly healed, or *varices* cut and healed, unleſs by a ſtrict courſe of diet they they hinder the generation and increaſe of accuſtomed excrements. Alſo thoſe which recover of great and long diſeaſes, unleſs they be fully and perfectly purged, either by nature or art; theſe humors falling into the joynts, which are the reliques of the diſeaſe, make them to become gouty: And thus much for the primitive cauſe. The internal or antecedent cauſe is the abundance of humors, the largeneſs of the veſſels and paſſages which run to the joynts, the ſtrength of the amandating bowels, the looſneſs, ſoftneſs, and imbecillity of the reviving joynts. The conjunct cauſe is the humor, it ſelf repact and ſhut up in the capacities and cavities of the joynts. Now the unprofitable humor, on every ſide ſent down by the ſtrength of the expulſive faculty, ſooner lingers about the joynts, for that they are of a cold nature and denſe, ſo that once impact in that place, it cannot be eaſily digeſted and reſolved. This humor then cauſeth pain by reaſon of diſtention or ſolution of continuity, diſtemper; and beſides the virulency and malignity which it requires. But it favours of the nature ſometimes of one, ſometimes of more humors; whence the Gout is either phlegmonous, eryſipelatous, œdematous, or mixt. The concourſe of flatulencies, together with the flowing down humors, and as it were tumult by the hinderance of tranſpiration, increaſeth the dolorifick diſtention in the membranes, tendons, ligaments and other bodies wherein the joynt conſiſts.

Lib. de aere, loc. & aqua. Lib. 1. cap. 17.

Lib. 3. ſen. 22. tract. 2. cap.

Another primitive cauſe of the Gout.

Alph. 19. ſect. 9.

The antecedent cauſe of the Gout.

The conjunct

Five cauſes of the pain of the Gout.

What and how the matter of the Gout comes down from the brain.

CHAP. IV.

Out of what part the matter of the Gout may flow down upon the joynts.

The matter of the Gout comes for the moſt part from the liver, or brain; that which deſcends from the brain is phlegmatick, ſerous, thin and clear, ſuch as uſually drops out of the noſe, endued with a malign and venenate quality. Now it paſſeth out by the muſculous skin and *Pericranium*, as alſo through that large hole by which the ſpinal marrow, the brains ſubſtitute, is propagated into the ſpine, by the coats and tendons of the nerves into the ſpaces

of

of the joynts, and it is commonly cold. That which proceeds from the liver is diffused by the great vein and arteries filled and puffed up, and participates of the nature of the four humors, of which the mass of the blood consists, more frequently accompanied with an hot distemper, together with a gouty malignity. Besides this manner of the Gout, which is caused by defluxion, there is another which is by congestion; as, when the too weak digestive faculty of the joynts 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 heavinesse of the head, a desire to rest, and a dulnesse 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 be much different from themselves by reason of the functions of the mind hurt by the malignity 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 gouty Humor, proceeding from the Liver.

THe right Hypocondry is hot in such gouty persons, yea the inner parts are much heated by the bowels, blood and choler carry the sway, the veins are large and swoln, a defluxion suddenly falls down, especially if there be a greater quantity of choler than of other humors in the mass of the blood. But if, as it often falls out, the whole blood, by means of crudities degenerate into phlegm and a wheyish humor; then will it come to pass, that the Gout also, which proceeds from the liver, may be pituitous or phlegmatick, and participate of the nature of an *œdema*, like that which proceeds from the brain. As if the same mass of blood decline towards melancholy, the Gout which thence ariseth, resembles the nature of a *scirrhus*; yet that can scarce happen, that melancholy by reason of the thicknesse and slownesse to motion may fall upon the joynts. Yet notwithstanding, because we speak of that which may be of these, it will not be unprofitable briefly to distinguish the signs of each humor, and the differences of Gouts to be deduced from thence. When the Gout which proceeds from the default of the liver, assimilates the nature of an *œdema*. Why the Gout seldom proceeds from melancholy.

CHAP. VII.

By what signs we may understand this or that humor to accompany the gouty malignity.

YOu may give a guess hereat by the Patients age, temper, season of the year, condion of the Country where he lives, his diet and condition of life, the increase of the pain in the morning, noon, evening or night, by the propriety of the beating, pricking, sharp or dull pain; by numnesse, as in a melancholy Gout or Itching; as in that which is caused by tough phlegm, by the sensible appearance of the part in shape and colour (as for example sake) in a phlegmatick Gout, the colour of the affected part is very little changed from its self, and the neighbouring well parts, in a sanguine Gout it looks red, in a cholerick it is fiery or pale, in a melancholy livid or blackish, by the heat and bignesse which is greater in a sanguine and phlegmatick than in the rest, by the change; and lastly, by things helping and hurting. And there be some, who for the knowledge of these differences, wish us to view the Patients urine, and feel their pulse, and consider these excrements, which in each particular nature, are accustomed to abound or flow, and are now suddenly and unaccustomarily suppressed. For hence may be taken the signs of the dominion of this or that humor. But more ample knowledge of these things may be drawn from the humors predominant in each person, and the signs of tumors formerly delivered. Only this is to be noted by the way, that the Gout which is caused by melancholy, is rare to be found.

CHAP. VIII.

Prognosticks in the Gout.

BY the Writings of Physicians the pains of the Gout are accounted amongst the most grievous and acute; so that through vehemency of pain many are almost mad, and with themselves dead. They have certain periods and fits, according to the matter and condition of the humor wherein this malign and inexplicable gouty virulency resides. Yet they more frequently invade in the Spring and Autumn; such as have it hereditary are scarce ever throughly free therefrom, as neither such as have it knotty: 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 become plaisterlike, so that it can neither be resolved nor ripened. That which proceeds from a cold and pituitous matter, causeth not such cruel tormenting pain, as that which is of an hot, sanguine or cholerick cause, neither is it so speedily healed, for that the hot and thin matter is more readily dissolved; therefore commonly it ceaseth not until forty days be past: Besides also, by how much the substance of the affected part is more dense, and the expulsive faculty more weak, by so much the pain is more tedious. Hence it is, that those Gouty pains which molest the knee, heel and The Gout frequent in the Spring and Fall. What Gout uncurable.

Gal. ad aphor. 49. sect. 5.

and huckle-bone, are more contumacious. The Gout which proceeds of an hot matter, rests not before the fourteenth or twentieth day. That which is occasioned by acrid choler, by the bitterness of the inflammation of the pain causeth a difficulty of breathing, raving, and sundry times a Gangrene of the affected part, and lastly death; and healed, it often leaves a palsie behind it.

Why the Sciatica causeth lameness.

Amongst all the gouty pains, the Sciatica challengeth the prime place, by the greatness of the pain and multitude of symptoms; it brings unquietness and watching, a Feaver, Dislocation, perpetual lameness, and the decay of the whole leg, yea and oftentimes of the whole body. Now lameness and leanness, or decay of the part are thus occasioned, for that the decurrent humor forceth the head of the thigh-bone out of the cavity of the huckle-bone; this being forceth out prest the muscles, veins, arteries, and that notable and large nerve which runs along the thigh, even to the further joynts of the toes, and by the way is diversly dispersed over the muscles of the whole leg: Therefore because the head of the thigh is put out of its place, the Patient is forced to halt; because the vessels and nerves are oppressed, the nourishment and spirits do not freely flow into the parts there-under, whence proceeds their decay. Yet it sundry times happens, that the head of the thigh being not displaced, many halt because the viscid humor, which is naturally implanted in that place, and continually flows thither, both for the nutrition of these parts, and the lubrication of the joynt for quicker motion, is hardned by heat and idleness, and the other unprofitable humors which flow down to their concrete, and so intercept the liberty of motion. A gross and viscid humor in what joynt soever it falleth and stayeth, doth the same. For by concretion it turns into a plaster-like nature at or near the joynt, possessing the cavities thereof, and it depraveth the figure of the part, making it crooked and knotted, which formerly was strait and smooth. Furthermore, every distemperature caused by the defluxion of humors, if it shall lye long upon any part, depraves all the actions, and oft-times wholly abolisheth them; so that there may be three causes of the leanness or decay of the joynt 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 joynt.

The causes of the lameness or decay of the limbs.

If contrary to custom and reason the pains of the Gout do not go away, or return at their accustomed periods, most grievous and dangerous diseases thereon follow; for the matter accustomed to flow down into the joynts, if it seize upon the substance of the liver, causes a flegmon; if it stay in the larger veins, a continual Feaver; if it flow in the membrane investing the ribs, a Plurisie; if it betake it self to the guts, and adhere to their coats,

How the Gout turns into the Palsie.

the Colick, or *Iliaca passio:* And to conclude, it produceth divers other symptoms, according to the diversity of the parts whereto it flows and abides. For thus sundry that have been troubled with the Gout, become paralytick, because the matter, which formerly flowed down into the joynts, stays in the substance and pores of the nerves, and so hinders the spirit that it cannot freely in its whole substance pass through them: Hence therefore comes the resolution of the part, whereinto the nerve is inserted. Old men can never be quite or absolutely cured of the Gout, for that the mass of their blood is so departed from its primary and native goodness, that it can no more be restored, than dead or sowred Wine. The Gout, which proceeds from a cold cause, invadeth slowly, and by little and little, and is helped by the use of hot things; that which is from

Why the Gout takes one in Winter, and the midst of Summer.

an hot matter quickly shews it self, and is helped by the use of cold things. Now, although the Gout more frequently returns in the Spring and Fall, yet it comes in the midst of Winter, the nerves being weakned by the excess of cold, and the humors prest out; otherwhiles in the midst of Summer, the same being diffused and dissipated. Lastly, it comes at any time or season of the year, if those who are subject to this disease feed plenteously, and do all things according to their own minds and desire. Those who are troubled with the Gout, feel and perceive change of weather, storms, rains, snows, winds, and such like, before they come. A Southerly constitution of the air, for example, fills the body with humidities, and stirs up the humors that lye quiet in the body; and therefore cause defluxions upon the weaker parts, such as the joynts, both by nature, as being without blood and flesh, as also by accident, for that they a long time have been accustomed to be so tormented; therefore their pains are increased in a

Why such as have the Gout upon them, do oft-times desire venery.

wet season. Many of these that are troubled with the Gout, desire venery in the bitterness of their pain, because the internal heat wherewith they then are inflamed, doth not dissipate into spirits and air, as the feaverish heat doth, but dissolves, and, as it were, melts down the seminal humor, which dissolved, flows to the genitals, filleth and distends them. The same thing befals carriage and running horses, for in these by labour, much heat sends flatulencies to the bottom of the belly. Yet venery is very hurtful to such as are troubled with Gout, because it dissipates the

Venery hurtful in the Gout.

spirits and native heat, and increaseth 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 variety of dainties, and in the mean space live idly and lazily are more frequently and cruelly tormented with the Gout than poor people, who live sparingly and hardly: Wherefore there have been seen not a few of such rich and riotous persons, who having spent their estates, therewith changed their health, together with their fortune and diet, and so have been wholly freed from the Gout.

CHAP. IX.

The general method of preventing and curing the Gout.

Aph. 30. sect. 6.

THose who desire to prevent the Gout, must not glut themselves with meat, must be quick to labour, and abstain from Wine and Venery, or certainly must not use them unless for their healths sake, must vomit and purge at certain times. *Hippocrates* writes, that bodies are not troubled with the Gout before the use of Venery. Yet at this day many Eunuchs are seen

to

to have the Gout, but especially those who abound with idleness and pleasure; yet these we have heretofore mentioned are very effectual, not only for the prevention, but also for the cure of the present disease. Yet we must diligently distinguish the causes, what they be, and whence they may proceed, and oppose thereto remedies contrary in quantity and quality. There are absolutely three distinct causes of Gout: A tainture from the Parents; a corruption of the humors by diet and air; a native, or adventitious weakness of the joynts. Against these there is a twofold indication: The first is the evacuation and alteration of the peccant humors, the other the strengthning of the weak joynts. These two shall be performed by diet conveniently appointed, purging, blood-letting, provocation of the hæmorrhoids, courses, vomit, sweat, urine, and fit application of local medicines. Therefore, when the time shall come, wherein the Gout accustometh to return by course, the Patient shall have a care of himself by a diligent manner of diet, he shall lessen the matter of the disease by Phlebotomy (if that the Gout shall arise from the blood) from the opposite part, that by the same means revulsion and evacuation may be made; as if the upper parts be inflamed, blood shall be drawn from the lower; if on the contrary the lower, out of the upper, always observing the straitness of the fibres. Thus the right arm being troubled with a gouty inflammation, the *Saphena* of the right leg shall be opened, and so on the contrary; but if this general blood-letting being premised, the pain shall not cease, it will be requisite to open the vein next to the pain, which I have often performed with happy success.

Two general scopes of curing the Gout.

Whence blood must be let in the Gout.

Yet Phlebotomy hath not the like effect in all, for it is not available to such as are continually and uncertainly troubled with gouty pains, or whose bodies are weak and cold, wherein phlegm only is predominant. We may say the same of purging, for though it be oft-times necessary, yet too frequently re-iterated, it proves hurtful; furthermore, neither of these remedies is usually very profitable to such as observe no order in meat and drink, which use venery too intemperately, who abound with crude and contumacious humors, whose joynts by long vexation of the disease, have contracted an hectick distemper and weakness, so that they are departed from their natural constitution, and suffer a great change of their proper substance. Wherefore as often as these greater remedies shall be used, a Physician shall be called, who according to his judgment may determine thereof. For oft-times diet proveth more available than medicines; Therefore the Patient (if the matter of the Gout be hot) shall either drink no Wine at all, or else very much allayed, that is, as much as his custom and the constitution of his stomach can endure. A fit time for purging and bleeding is the Spring and Autumn, because, according to the opinion of *Hippocrates*, Gouts reign chiefly in these seasons; in Autumn, for that the heat of the precedent Summer debilitateth the digestive faculty, the native heat being dissipated: As also the eating of Summer-fruits hath heaped up plenty of crude humors in the body, which easily flow down into the passages of the joynts opened and dilated by the Summers heat: Add hereunto, that the inequality or variableness of Autumn weakneth all nervous parts, and consequently the joynts. 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 body, and being attenuated, fall into the joynts upon a very small occasion, therefore there is great both necessity and opportunity for evacuation, which if it shall not avert the accustomed fit, yet it will make it more gentle and easie.

What goury persons find no benefit by phlebotomy.

In what Gout diet proves more effectual than medicines.

Aph. 55. *sect.* 6.

CHAP. X.

Of Vomiting.

VOmiting is by all the Antients exceedingly commended, not only 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 joynts, are excluded and diverted by vomit, and also there is attenuation of that phlegm, which being more thick and viscid, adhereth to the roots of the stomach: yet you must consider and see, that the Patient be not of too weak a stomach and brain, for in this case vomiting is to be suspected. For the time, such as have excrementitious humors flowing down to the stomach through any occasion, as by exercise and motion, must vomit before they eat; on the contrary, such as are over-charged with an old congestion of humors, must vomit after they have eaten something. Certainly, it is safer vomiting after meat, than it is before. For the dry 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 artery in the chest or lungs, especially if the Patient be strait-chested, and long-necked, the season cold, and he unaccustomed to such evacuation. I remember that with this kind of remedy I cured a certain Gentleman of *Geneva*, grievously molested with a cruel pain in his shoulder, and thereby impotent to use his left arm; the Physicians and Surgeons of *Lions* seemed to omit nothing else for his cure. For they had used purging, phlebotomy, hunger, a diet-drink of *Guaiacum* and *China* (although his disease was not occasioned by the *Lues venerea*) and divers other topick medicines, nether yet did they any thing avail. Now learning by him that he was not apt to vomit, but that it was difficult to him. I wished him to feed more plentifully, and that of many and sundry meats; as, fat meats, onions, leeks; with sundry drinks, as Bear, Ptisan, sweet and sharp Wine, and that he 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 enduring so great confusion and perturbation of meats and drinks, whereof some were corrupted already in the stomach, and other-some scarce altered at all, Nature not enduring this confusion and perturbation, would easily, and of its own accord provoke the stomach to vomit; which that it might the better succeed, he should help forward Natures endeavour, by thrusting his finger or a feather into his throat, that so the thick and tenacious phlegm might by the same means be evacuated:

To what Gout vomiting is to be used.

What time the fittest therefore.

An History.

How to make one vomit easily.

And

Lib. de rat. vi-ctit.

And not content to do thus once, I wished him to do the like the second and third day following; for so it verifieth that saying of *Hippocrates*, *The second and third day exclude the reliques of the first*: Afterwards, that he should vomit twice a month, chaw Mastick fasting, rub his neck and the pained part with *Aqua vitæ*, strengthned by infusing therein Lavander, Rosemary, and Cloves grosly beaten, confirm his arm by indifferent exercise: He 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 quantity of warm water, wherein Radish roots have been boiled, and they shall have a care left by using their stomachs to this excretion by vomit, they weaken the digestive and retentive faculty thereof. Wherefore such as can naturally, shall think it sufficient to vomit twice a month.

CHAP. XI.

The other general remedies for the Gout.

How diuretick are good for the Gout.

THe defluxion of serous humors is very fitly diverted from the joynts by the urine, by the use of diuretick medicines. Therefore the roots of Sorrel, Parsly, *Ruscus*, *Asparagus*, and Grass, and the like, shall be boiled in Broth, and given to such as have the Gout: For when the urine floweth much and thick, the pain is lessened. Many have found benefit by issues; for the Arthritick malignity flows forth of these, as by rivulets; experience shews it in such as are troubled with the *Lues venerea*, for in those that you cannot overcome the malignity by the proper antidote, that is, Quick-silver, they feel no greater ease of the pain, then by application of Caustick, and making of issues. They shall be made in sundry places, according the difference of the pained joynts, to wit, in the beginning of the neck, if the defluxion proceed from the brain, and fall into the joynts of the collar-bones or shoulder; if into the elbow or hand, under the muscle *Epomis*; if into the hip, knees and feet, some three fingers breadth under the knee, on the inside: For thus there will follow more plentiful evacuation, by reason that the *Sapheia* runneth down that way. Yet if the Patient be troubled with much business, and must travel much on horse-back, then shall they be made on the out-side of the leg, between the two bones thereof, that so they may trouble him the less in riding. If any had rather use an actual Cautery, let him take such an one as is triangular and sharp, that so he may with more speed and less pain, perform that which he intends, and let him thrust it through a plate of iron which hath an hole therein, and let the plate be marked, left he should err; the ulcer shall be kept open, by putting in a pill of gold, silver, lint, or the root of Orris, Hermodactiles, Gentian, Wax, wherewith some powder of Vitriol, Mercury or Alum shall be incorporated, left it should fill up with flesh sooner than the Physician shall think fit. In the mean space, the head, oft-times the original of the evil, shall be evacuated by taking in the Winter the pills *Cochiæ*, and *de Assajereth*; but in Summer *sine quibus*, or *Imperiales*, before the full of the Moon. ℞ *Pul. hieræ simp.* ʒ i. *agar. recent. troch. & rhei an.* ʒ ij. *myrobal. chebul.* ʒ ß. *Tamarind.* ℈ ij. *Cum infusione senæ, fiat massa de qua formentur pil. vi. pro drachma:* Let the Patient take two before supper every eighth day; the day after he shall drink some broth of the decoction of cicers, and the diuretick roots. Also these following pills will be good to purge the phlegmatick and serous humor. ℞. *Pilular. fœtid. & de hermodactyl. an.* ʒ ß, *fermentur cum succo vel syrup. rosar. solut.* Or else, ℞ *Aloes* ʒ iij. *Agarici trochisc. & rhei, an.* ʒ i. *Massæ pilul. arthrit. & de Hermodact. an.* ℈ ij. *Diacrid.* ℈ ß; *cum mele rosato fiat massa, capiat pondus,* ʒ i. as the Physician shall think fit, by whose advise these shall be used and changed as occasion shall offer it self, and the nature of the humor causing the disease. The day after the purging, the Patient shall take three hours before meat half a dram of treacle, to strengthen the entrails: Pills are preferred before liquid medicines, for that by their too long stay in the stomach they easily attract the noxious humor from the brain, and the other more distant parts. I have known some Physicians, who mixing with ordinary pills a good quantity of Scamony, as seven or eight grains, with a little Ginger, left it should hurt the stomach, have purged by stool a great quantity of serous humors; the day following they gave Barley cream to correct the harm which the Scamony may have done to the stomach. Others for the same purpose give treacle, which doth not only strengthen the entrails, but also weakens the virulency of the gouty malignity; the orifice of the ventricle must be shut after meat, that so the vapors ascending to the brain may be restrained: For this purpose common [illegible]-powder, marmelate, or conserve of Roses are good. In a wet season use Cephalick perfumes thus made: ℞ *Thuris vernicis, & mastich. an.* ʒ i. *granorum juniperi, baccarum lauri, an.* ʒ ß. *Ligni aloes* ʒ ij. *Assæ odoratæ* ʒ i. ß. Let them be grosly beaten; let the fume be received in tow, or carded cotton, and so applied to the Head. Also the excrementitious humors shall be dried up by the following powder strewed on the Patients head for fifteen days. ℞ *Fol. ros. rub. senæ, staechad. utriusque an.* m. ß. *Milii,* ℥. iiij. *Furfuris loti in vino albo,* ʒ iij. *Florum chamæm. melil. an.* p. i. *Sem. anisi* ℥ i. *Salis com.* ʒ ii. *Fiat omnium pulvis.* Let it be put into linnen bags, with which, being warmed at the fire in a frying-pan, and kept with stirring, the head shall be rubbed. Let the following medicine be chawed, and kept in the mouth in the form of a Masticatory, in the time of the falling down of the defluxion. ℞ *Cubebarum, nucis moschat. glycyrrhiz. anis. an.* ʒ i. *Pyrethri,* ʒ ij. *Mastich. rad. staphisag. eryngii, an.* ʒ ij. Let them all be made into powder, and mixed together, and tied up in a little taffaty to the bignes of a hasel-nut, and let them be rowled up and down the mouth with the tongue to cause 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 only causeth revulsion from the feet, but also the resolution of that which is unprofitable.

Issues or fontanels.

Where to be made.

An actual cautery.

Pills.

Common pills with the addition of Scamony.

Treacle, how useful in the Gout.

Cephalick fumigations.

Cephalick bags.

A Masticatory.

CHAP. XII.

What diet is convenient for such as have the Gout.

AFter the body is once fed, they must not return to meat before that the concoction be perfected in the stomach, lest the liver be 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 body; for the following decoctions do 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 variety one meal, so must they eschew the use of pulses, milk-meats, sallads, and sharp things; as verjuice, vinegar, the juice of oranges, and citrons. They shall not eat unless they be hungry, and shall desist therefrom before they be fully satisfied, if it be but for this, that whilest the native heat is busied in the digestion of meat 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 difficulty digested in the stomach. Some of the ancients have disallowed of the eating of capons, and such like birds, because they are subject to be troubled with the Gout in the feet. Fishes are to be 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 be commended, for that it breeds temperate blood, and laudable juice, and is easily digested. Neither in the mean time is mutton to be found fault withall. But the like hunger or abstinence must not be appointed to all men troubled with the Gout, for such as are of a sanguine and cholerick complexion, because they are endued with much, and much wasting heat, are to be refreshed with more plentiful nourishment; for hunger sharpens choler, and so augments their pains; neither in the *interim* must they be fed with too much moist meats, for too much moisture, besides that it is the author of the putrefaction, will cause defluxions, and draw down the matter to the joint. Therefore the cholerick humor must be incrassated and refrigerated by taking things inwardly, and applying things outwardly lest by its tenuity it should fall down into the grieved parts. To this purpose conduce broths altered with lettuce, purslain, sorrel, and the like herbs, and barly 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 carry their provant about them, wherefore they must not be fed, neither with many, nor with moist meats. All that are troubled with the Gout, must shun those things that are hard of digestion, and which are soon corrupted, for they all have a certain remiss feaver, which diminisheth the native heat, and makes the meats apt to putrifie. Too plentiful drinking not only of wine, but also of any other liquor is to be avoided. For by too great a quantity of moisture the meat float in the stomach and the native heat is in some sort extinguished, whence proceed crudities. Some Physicians commend the use of white wine, for that it provokes urine, which is not altogether to be disallowed, if so be that the body be free from excrements, otherwise by this, as it were a vehicle, especially if the temperature of the body be somewhat more hot, they shall be carried down into the joints. Therefore in such a case I should rather advise them to use claret, which is somewhat weak and astringent, for that it doth not so much offend the head nor joints, and it shuts and strengthens the orifices of the vessels, yet it will be more convenient wholly to abstain therefrom, and instead thereof to drink an *Hydromel* made after this manner: ℞ *aquæ* lb iv. *mellis opt.* q. j. *bulliant ad consumptionem* lb j. *bene despumando, adde ad finem salviæ* p. j. *imo si æger sit pituitosus, cinnamomi aut caryophyllorum momentum.* For cholerick persons make a sugred water thus: ℞ *aquæ fontis* lb iv. *sacchari* . . . j. *colentur per manicam sine ebullitione, addendo in fine cinnamomi* ʒij. For thus the stomach shall also be strengthened; also he may drink *ptisan*, wherein at the end of the decoction shall be boiled some dried roses, or else some syrup of pomegranates added thereto, lest it should offend the stomach; as soon as it comes from off the fire, let it stand and settle, and then strain it through an hypocras bag, or clean linnen cloth.

The fault of the first concoction, is not amended in the after.

Capons subject to the Gout.

Cholerick persons cannot away with long fasting.

Phlegmatick bodies in fasting feed upon themselves.

White wine not good for the gout.

Claret may be the safelier drunk.

Hydromel most safely.

An *Hydrosaccharum.*

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 be able to resist the humors preternaturally falling down upon them. Wherefore it is good morning and evening to rub them with *oleum omphacinum*, that is, oil made of olives not come to their perfect maturity; or with oil of roses mixed with common salt finely powdered. It may also be mixed with common oil, adding thereto the powder of Harts-horn, as that which hath an astringent and drying faculty. Also it is good to bathe them in this following lee: ℞ *cort. granat. unciam cupress. gallarum, sumach. cortic. querni, an.* ʒij. *salis com. alumin. roch. an.* ʒj. *salviæ, rorismar. lavendul. lauri, ivæ arthritic. an.* m. j. *rosar. rub.* m. ß. *bulliant omnia in* vi. lb *vini crassi & astringentis, & lixivio parato ex aqua chalibeata, & cinere querno.* Then foment the part with spunges or cotten cloths; after, this fomentation shall be carefully wiped and dried with hot linnen cloths, taking 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 cause, then, ℞ *salviæ, rorismar. thymi, lavendul. laur. absinth. an.* m. j. *caryophyl. zinzib. piperis, conquassatorum an.* ʒj. *infundantur in aqua vitæ & vini rubri astringentis, an.* lb iv. *bulliant leniter in balneo Mariæ.* With this liquor foment the joints morning and evening. Some think it good to strengthen the joints, to tread grapes in vintage-time, which if they be not able to do, then let them wash their feet in the must or new pressed wine.

A fomentation to strengthen the joints.

The juice of haws with oxycrate.

Bags. Alſo bags may be thus made for the ſame purpoſe. Rc *ſalis com. alum. roch. cort. granat, ſumach. berberis, nucum cupreſſi, an.* ℥iv. *fol. ſalviæ, roriſm. roſar. rub. an.* m. ß. Let them be all put in linnen bags, and boiled in lee, and ſo make a decoction, for to foment the joints.

CHAP. XIV.

Of the Palliative Cure of the Gout and the material cauſes thereof.

The ſcopes of curing. HEre alſo muſt we conſider the cauſes whence this diſeaſe proceeds, the temper of the diſeaſed body, the parts affected, and thoſe from whence it proceeds. For as theſe are not always alike, ſo neither can one and the like remedy be uſeful in every Gout. For firſt thoſe which proceed of a cold cauſe require other remedies, than thoſe which ariſe from a hot, and that which proceeds from any one ſimple humor, than that which ariſeth from diverſe mixed together. For Choler alone cauſeth cruel pains, but tempered by the admixture of Phlegm, it becomes more gentle. Furthermore ſome remedies are good in the beginning, ſome in the encreaſe, and ſome at other times. Neither may we uſe repercuſſives in the Sciatica, as we may in the Gout of the feet and other joints; unleſs peradventure the part be fearfully inflamed. Taking theſe things to conſideration we muſt obſerve that the Palliative cure of that Gout, which cannot abſolutely be helped, as that which is hereditary and inveterate, is performed by four ſcopes. The firſt is by appointing a convenient diet in the *ſix things* which are termed *not-natural*. The ſecond by evacuating and diverting the antecedent matter, both by purging and phlebotomy. 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 malignity of the virulent quality aſſociating the humor that it alone is oft-times ſufficient to kill the patient. And becauſe the variety of morbifick cauſes, brings a variety of remedies, fitted to theſe four intentions, therefore it behoves a Phyſician to be moſt attentive in the diſtinction of the cauſes. For he may be eaſily deceived and miſtake one for another; for arthritick pains proceeding from a cold matter, if they be mitigated by the application of Narcotick and cold medicines, it may induce us to believe that the material cauſe is hot, though really it be not ſo; for Narcoticks aſſwage pain, not for that they are contrary to the cauſe thereof, but becauſe they take away the ſenſe by inducing a numneſs; on the contrary, the material cauſe may ſeem cold, which notwithſtanding is hot, for that it becomes better by application of hot medicines, that is, by taking an argument from that which helps, becauſe contraries are cured by contraries, and the like preſerved by the like. But herein conſiſts the error, for that hot medicines profit not by their contrariety, but by the attenuation of the groſs matter, by the rarefaction of the skin, and diſſipating them into air. Whence you may gather, that an argument drawn from that which helps and hurts, is very deceitful: moreover it may happen that a large quantity of cold matter flowing down from the brain, may cauſe great pain by reaſon of the virulency, and a ſmall quantity of choler mixed therewith, which ſerves for a *vehicle* to carry down the tough and ſlow phlegm into the joints, whence the patient becomes thirſty and feaveriſh by reaſon of the heat and inflammation of theſe parts, whereby ſuch as are leſs cautelous and heedy will eaſily be induced to believe that ſome hot matter is the occaſion of this Gout. Now when as not ſome one ſimple humor, but different by reaſon of mixture, cauſeth the Gout, the yellowiſh colour of the part may deceive one, as, if the evil matter ſhould proceed from choler only, which by the tenuity of its ſubſtance leaving the center, eaſily poſſeſſeth the circumference of the body or part: and notwithſtanding much phlegm being as it were enraged by the admixtion of a little choler, may be the chief cauſe of the diſeaſe, and may peradventure be diſcovered by the encreaſe of pain in the night ſeaſon. A feaver ariſing by means of pain and watching may encreaſe the conceived opinion of choler, which attenuating and diffuſing the humors, drives them into the joints, and cauſeth fiery urines, tinctured with much choler, and a quick pulſe. Yet notwithſtanding the Phyſician ſhall be in an error, if deceived with theſe appearances, he attempt the cure of this Gout, as ariſing from a hot, and not from a cold cauſe: yet I am not ignorant that the cure of the proper diſeaſe muſt be neglected for the cure of the ſymptoms. Beſides alſo it may come to paſs that choler may be the cauſe of the Gout, and notwithſtanding no ſigns thereof may appear in the skin and ſurface of the affected part, becauſe the coldneſs of the ambient air, and the force of applied Narcoticks may have deſtroyed the colour of the juices lying thereunder, and as it were imprinted a certain blackneſs. It alſo happens that the body being overcharged with a great quantity of groſs and viſcid humors the expulſive faculty may diſcharge ſome portion thereof unto the joints, but leave the reſt impact in the cavity of ſome entrail, where cauſing obſtruction and putrefaction, may preſently cauſe a feaver, and that intermitting, if it be ſmall, and obſtruct only the leſſer veins, and theſe of the habit of the body. Wherefore then it is not ſufficient that the Phyſician employ himſelf in the cure of the Gout, but it behoves him much to attend the cure of the feaver, which if it be continual, it diſcredits the Phyſician, and endangers the patient; if it be intermitting, it eaſily becomes continual, unleſs it be withſtood with fit remedies, that is, unleſs you let blood, the belly being firſt gently purged, and nature be preſently freed by a ſtronger purge of the troubleſome burden of humors. Now it is convenient, the purge be ſomewhat ſtronger than ordinary; for if it ſhould be too weak, it will ſtir up the humors, but not carry them away, and they thus agitated will fall into the pained and weak joints, and cauſe the Gout to encreaſe. By this it appears how deceitful that conjecture is, which relies and is grounded on one ſign, as often as we muſt pronounce judgment of morbifick cauſes. Wherefore to conclude, we muſt think that opinion moſt certain concerning the matter of the diſeaſe, which is ſtrengthned with multiplicity of ſigns, as thoſe which are drawn from the colour of the part, the heat or coldneſs manifeſt to the touch,

Repercuſſives not to be uſed in the *Sciatica*.

The palliative cure performed by four ſcopes.

An argument taken from that which helpeth or giveth eaſe, is not always certain.

How cold diſeaſes may be helped by cold, and hot, by hot medicines.

The firſt thing that may deceive 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 reſts upon multiplicity of ſigns.

thoſe

those things that help and hurt, the patients familiar and usual diet, temper, age, region, season of the year, propriety of pain, the exacerbation or excess thereof, in what days, and in what hours of the day, the length of these fits, the urine and other excrements coming from the patients body. But for that not a few are in that heresie, that they think that we must neither purge nor let blood in the Gout, we must here convince that opinion; For seeing that physick is the addition of that which wants, and the taking off those things that are superfluous, and the Gout is a disease which hath its essence from the plenty of abounding humors, certainly, without the evacuation of them by purging and bleeding, we cannot hope to cure, either it, or the pain which accompanies it. *Metrius*, in his Treatise of the Gout writes, that it must be cured by purging, used not only in the declination, but also in the height of the disease, which we have found true by experience; and it is consonant to this saying of *Hippocrates*; In pains we must purge by the stool. Besides also, *Galen* professeth that in great inflammations, fevers and pains, he knew no greater nor surer remedy than to let blood, even to the fainting of the Patient. If those which are in this case shall not become better by purging and phlebotomy conveniently prescribed, then it happens by the means of drunkenness, gluttony, and the like distemper. For hence abundance of crude humors are heaped up, which by their contumacy yield themselves less obedient to medicines. Therefore such gouty persons as are intemperate and given to gluttony and venery; may hope for no health by use of medicines.

Why we must use purging and bleeding in the Gout.

Lib. de affect. ubi de Arthrit. loquitur.

Ad aph. 23. sect. 1.

Lib. de cur. per sang. missionem.

CHAP. XV.

Of local medicines which may be used to a cold Gout.

Little do topick medicines avail, unless the body of the gouty patient shall be purged from excrementitious humors; besides also there is danger lest by the use of repelling medicines, the virulency of the humor may be driven into the entrails, which thing hath been the cause of sudden death to many. Now in the first place we will speak of local medicines which are thought meet for a phlegmatick juice, because this is more frequent, than that which is from a hot cause. At the beginning in every Gout, the *Sciatica* excepted, we must use astringent things which have a faculty to bind or strengthen the joints, and to dry and waste the excrementitious humor. As, ℞ *fol. sabinæ* m. ß. *nucum cupressi* ℥iij. *aluminis roch.* ℥j. *gum. tragacanthæ* ℥iv. *mucilaginis psilii & cydon. quantum sufficit, fiat cataplasma.* Or, ℞ *stercoris bubuli recentis* ℔ j. *mellis ros.* ℥iv. *olei ros. & aceti an.* ℥ij. *bulliant simul parum, fiat cataplasma.* Or else, ℞ *olei roser. & myrtill. an.* ℥ij. *pulveris myrrhæ & aloes an.* ℥j. *acaciæ* ℥ij. ß. *incorporentur cum aqua gallarum coctarum, & fiat unguentum.* Some boil sage, camomile and melilote flowers, wormwood and danewort, of each a handful in a sufficient quantity of vinegar, then they put the grieved part into this decoction being warm; and by frequent using this medicine, it hath been found to repel and consume the noxious humor, not only cold, but also cholerick; and also to strengthen the part. The fresh *faeces* of Olives laid to the part, assuage pain: dried Oranges boiled in vinegar, beaten and applied, do the same. Or, ℞ *medii corticis ulmi* ℔ ß. *caudæ equin. stœchad. consolid. majoris, an.* m. ß. *aluminis roch. thuris an.* ℥iij. *farin. hordei* ℥v. *lexivii com. quantum sufficit, fiat cataplasma ad formam pultis satis liquidæ.* Commonly then when as the part swelleth up, the pain is lessened, for that the expulsive faculty 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-ach have less pain when their cheeks begin to swell.

It is not safe to use repercussives in the Gout before purging.

An astringent Cataplasm.

A discussing fomentation.

One, partly astringent and partly discussing.

After repercussives, we must come to those which evacuate the contained humor by evacuating or resolving it. For every defluxion of humors remaining in any part requires evacuation. Neither must we marvel thereat, if the digested humor doth not vanish at the first time; for we 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 dense than fleshy parts. ℞ *rad. bryon. sigilli beat. Mariæ an.* ℥iv. *bulliant in lixivio, postea terantur, & colentur per setaceum, addendo farin. hordei & fabarum an.* ℥j. *olei chamæm.* ℥iij. *fiat cataplasma.* Or, ℞. *hordei & lupin. an.* ℥iij. *sulphuris vivi & salis com. an.* ℥j. *mellis com.* ℥v. *pul. aloes & myrrhæ an.* ℥ ß. *aq. vit.* ℥j. *cum lixivio, fiat cataplasma.* Or, ℞ *succi caulium rub. aceti boni, an.* ℥iv. *farin. hordei* ℥j ß. *pul. Hermodactyl.* ℥ ß. *vitellos ovorum* nu. iij. *olei chamæm.* ℥ij. *croci* ℈ij. some burn the roots and stalks of Coleworts, and mix the ashes with hogs grease and the powder of Orris, and so make a pultis. Or, ℞ *Lactis vaccini* lb. ij. *micæ panis albi quantum sufficit, bulliant simul, addendo pulveris subtilis florum chamæm. & meliloti an.* m. ß. *croci* ℈j. *vitellos ovorum* nu. iv. *ol. ros.* ℥iij. *butyri recentis* ℥j. *terebinth.* ℥ij. *fiat cataplasma ad formam pultis satis liquidæ.* This Cataplasm may be applied with good success, not only to phlegmatick and cold, but also to any gout, at any time to mitigate the extremity of the pain in men of any temper, and it must be changed twice or thrice a day. Also Treacle dissolved in wine, and anointed on the part, is said to assuage this pain. You may for the same purpose make and apply emplaisters, unguents, cerats, and liniments: This may be the form of an emplaister. ℞ *gummi ammoniaci, bdelii, styracis, an.* ℥ij. *cum aceto & aqua vit. dissolve & adde farin. fænugr.* ℥ ß. *olei chamæm. & aneth. an.* ℥ij. *ceræ quantum sufficit, fiat emplastrum molle.* Or, ℞ *rad. bryon. sigill. beat. Mariæ an.* ℥v. *bulliant in lixivio complete, & colentur per setaceum, addendo olei cham.* ℥iv. *sevi hircini* ℥iv. *ceræ nov. quantum sufficit, fiat emplastrum molle.* Or, ℞ *gum. ammon. opopanacis, galbani, an.* ℥ij. *dissolvantur in aceto, postea colentur, adde olei liliorum, terebinth. venet. an.* ℥j. *picis navalis, & cer. nov. quantum sufficit, fiat emplastrum molle.* Or else, ℞. *succi rad. enul. camp. & ebuli an.* ℥iij. *rad. alth.* ℔ ß. *coquantur & colentur per setaceum, addendo florum cham. melil. sambuci, verisimar. & hyperici an.* p. ij. *nucum cupressi,* nu. iv. *ol. cham. aneth. hyper. liliorum, de sticæ an.* ℥ij. *pinguedinis anatis, gallin. anserin. an.* ℥ ß. *varm viridis vivus* nu. vi. *catellos duos nuper natos, bulliant. omnia simul, in* ℔ ij. ß. *vini odoriferi & unæ aquæ vit. ad consumptionem succorum & vini, & ossium catellorum dissolutionem, & fortiter exprimantur;*

Why the gouty humor doth not presently vanish upon the use of repercussives.

Greater discussers.

A cataplasm good for any Gout at any time.

Discussing emplaisters.

primantur ; & expreſſis adde terebinth. ℥iij. *cer. quantum ſufficit, fiat emplaſtrum molle.* Alſo, *Emp. de Vigo. Oxycroceum, de mucilaginibus, de melliloto* and the like mixed together, and ſoftned with a little oil or *axungia*, are of the like faculty, and good for the ſame purpoſe.

Ointments. Let this be the form of an ointment. ℞ *anſerem pinguem, & imple eatellis duobus, de quibus demè eutem, viſcera, caput & pedes ; item accipe ranas* nu. x. *colubros detracta cute in fruſta diſſectos* nu. iv. *mithridat. & theriac. an.* ℥ ß. *fol. ſalviæ, roriſmar. thymi, rutæ, an.* m. ß. *baccarum lauri, & juniperi, conquaſſat. an.* ℥j. *pulveris nuc. moſchat. zinzib. caryophyl. & piper. an.* ʒj. *de eo quod ſtillabat fiat unguentum vel linimentum cum cera & terebinth. veneta, pauca, aq. vitæ addita* ; this marvelouſly aſſwageth the pain of the Gout ariſing from a cold cauſe. Another, ℞ *gummi pini, & laudani, an.* ℥iv. *gummi elemi & picis naval. an.* ℥ ß. *terebinth. venet. claræ* ℥vi. *chamæm, & liliorum an.* ℥vi. *vini. rub.* ℔. i ß. *aq. vit. & ſalv. an.* ʒvj. *diſſolvantur omnia ſimul lento igne baculo ſemper agitando, deinde adde pul. ireos, flor. baccarum lauri & hermodactyl. an.* ℥ij ß. *maſtiches, myrrhæ & olibani an.* ℥ij. *farinæ fabar.* ℥iv. *incorporentur omnia ſimul, fiat unguentum molle.* Or elſe, ℞. *mucilag. ſeminis fœnugr. in aceto extract. quantum volueris, cui miſce mellis quantum ſufficit* ; let them be boiled together until they acquire the conſiſtence of an ointment. Theſe things ſhall be changed, as often as need ſhall ſeem to require.

Diſcuſſing fomentations. Alſo an anodyne and diſcuſſing fomentations are good to reſolve ; as this, ℞ *fol. rutæ, ſalv. roriſmar. an.* m. j. *bulliant cum aceto & vino* ; and ſo make a decoction for a fomentation, which you may uſe not only in a cold Gout, but alſo in a hot, becauſe it reſolveth and ſtrengtheneth the part by aſtriction, and freeth it from the defluxion : you muſt have a care that the medicines which are uſed to pains of the Gout be changed now and then. For in this kind of diſeaſe that remedy which did good a little before, and now availeth, will in a ſhort time become hurtful.

Remedies muſt be often changed in the Gout.

But if the the contumacy and exceſs of the pain be ſo great, that it will not yield to the deſcribed medicines ; then it is fit, becauſe the diſeaſe is extreme, to uſe (according to *Hippocrates* counſel) extreme, ſuch are are thoſe which follow. ℞ *axungiæ gallinæ, olei laurini maſtic. & euphorb. an.* ℥j. *pulv. euphorb. & pyreth. an.* ʒj. *fiat litus* ; herewith let the part be rubbed every day, for it is a very effectual medicine. For *Euphorbium* and Pellitory by their heat attenuate and reſolve, the capons greaſe and oil of bays relax, the oil of maſtich ſtrengtheneth the part and hindreth a new defluxion. Alſo there is made a very anodyne ointment of oil of Foxes, wherein earth worms, the roots of elecampane and bryony have been boiled, with a little turpentine and wax ; this ſoftens, attenuates and reſolves the cold humor impact in the joints. Or elſe, ℞ *ſeminis ſinapi pulviſcrati, & aceto acerrimo diſſoluti,* ℥iij. *mellis anacardani* ℥ij. *aquæ vitæ* ℥j. *ſalis com.* ℥ij. let them be all mixed together, and applied to the pained part. Or, ℞ *picis nigræ,* ℥iij. *terebinth. venetæ* ℥j. *ſulphuris vivi ſubtiliter pulveriſati* ℥iij. *olei quantum ſufficit, liqueſiant ſimul, fiat emplaſtrum* ; let it be ſpread upon leather, and laid upon the part for two or three days ſpace, if the patient perceive any eaſe thereby ; if otherwiſe, let it be changed as we ſaid before. Some for the ſame purpoſe apply nettles thereto, and preſently after waſh the part in the ſea or ſalt water. Others foment the part with vinegar wherein pigeons have been boiled. A veſicatory made of very ſower leaven, *cantharides*, and a little *aqua vitæ* is very powerful to evacuate the conjunct matter. For thus the malign and virulent *ſerum*, or whayiſh humor is let out, whence follows ſome eaſe of the pain. Now there are ſome gouty pains, which cannot be leſſened or aſſwaged unleſs by remedies more powerful than the diſtemper, therefore veſicatories ought not to be rejected, ſeeing that the Ancients in this affect have alſo made uſe of actual cauteries, as we ſhall ſhew hereafter. *Chriſtopher Andreas* in his book termed *Occitarie* [that is, domeſtick phyſick] much commends Oxdung wrapped in cabbage or vine-leaves, and roaſted in the embers, and ſo applied hot to the grieved part.

A great diſcuſſer.

An Anodyne.

A veſicatory againſt the contumacy of the conjunct matter.

CHAP. XVI.

Of local medicines to be applied to a hot or ſanguin Gout.

What repercuſſives are here required.

HEre muſt we in the beginning make uſe of repercuſſives, ſuch as are cold and dry, that they may contend with the morbifick matter by both their qualities ; alſo let them be aſtrictive, ſo to add ſtrength to the part. But I would have you always to underſtand that you muſt firſt premiſe general medicines. ℞ *albuminum ovorum* nu. iv. *ſuccl lactucæ & ſolani an.* ℥j. *aq. roſar.* ℥ij. *incorporentur ſimul, & fiat linimentum ſæpius renovandum.* Others take the meal of barly, lentils, *acatia*, oil of roſes, myrtles, and with a little vinegar they make a cataplaſm ; Or, ℞. *ſumach. myrtillorum, boli arm. an.* ʒ ß. *acaciæ, corticum granat. balauſt. an.* ʒij. *aq. plantag. & roſar. an.* ℥iij. *ol. roſati* ℥j ß. *aceti* ℥ij. *farinæ hordei & lentium quantum ſatis erit, fiat cataplaſma.* This is very excellent and effectual to ſtay or hinder phlegmonous and erylipelatous tumors. Alſo you may make a cataplaſm *ex mucagine Cidoniorum in aquâ roſarum extractâ, caſſia fiſtula, oleo roſato, & aceto* : Or, ℞ *pamponorum viridium,* m. ij. *terantur & bulliant in oxycrato ex aqua fabrorum, cui adde ſumach. concuſſat.* ℥j. *olei roſat.* ℥ij. *farinæ hordei quantum ſufficit, fiat cataplaſma.* Or elſe, ℞ *ſuccl ſempervivi, hyoſcyami, portulacæ an.* ℥iv. *corticum mali granati* ℥j ß. *farinæ hordei* ℥v. *vini auſteri quantum ſufficit, fiat cataplaſma* ; this is much commended, for it hath entring thereinto wine and the pomgranate pill, which both are very great aſtrictives ; and the juices are exceeding cooling, the meal alſo hinders and thickens the ſanguin humors that are ready to flow down, and make the medicine of a good conſiſtence. Another : ℞ *fol. hyoſcyami & acetoſæ an.* m. j. *involvantur papyro, & ſub cineribus coquantur, mox cum unguento populeon, aut roſat.* ℥ij. *incorporentur* ; and then lay this Cataplaſm thus made warm unto the part. Another : ℞. *florum hyoſcyami* ℔ ij. *ponantur in phiala vitrea, & recondo in ſimo equino donec putruerint, accipe ex putredine* ℥ij. *in quibus diſſolve olei de junipero* ℥ ß. *fiat linimentum ad uſum.* Others beat pulp of a Gourd or Citrul in a mortar, and ſo apply it. Another : ℞ *mucilag. ſem. pſilii, & cydon. extract. in aq. roſar. & ſolani an.* ℥iv. *olei roſati*

An excellent aſtringent cataplaſm.

omphacini

omphacini ℥iii. *vini granat.* ℥i. *vitellos ovor. cum albumine* nu. iii. *camphoræ* ʒi. *incorporentur simul, fiat linimentum.* Or else, R. *ol. rosat. omphacini* ℥iv. *albumen ovorum cum vitellis* nu. vi. *succi plantag. & solani an.* ℥i. *farinæ hordei* ℥iii. *incorporentur simul, fiat cataplasma.* Or, R. *farinæ fabarum & hordei an.* ℥iii. *olei rosati,* ℥ii. *oxycrati quantum sufficit, coquantur simul, fiat cataplasma.* Another, R. *mucilag. cent. psilii.* ℥iv. *ol. rosati* ℥ii. *acet.* ℥i. *vitellos ovorum,* nu. iii. *croci* ℈i. *misce. Pliny* reporteth that *Sextus Pomponius* the Governour of the hither-Spain, as he overlooked the winnowing of his corn, was taken by the pain of the Gout in his feet, wherefore he covered himself with the Wheat above his knees, and so was eased, his feet being wonderfully dryed; and he afterwards used his kind of remedy. It is note-worthy, which often happeneth, that the pain cannot be altogether eased by such remedies, by reason of the abundance of blood impact in the part; wherefore it must be evacuated: which I have done in many with good success, opening the vein which was most swelled and nigh to the affected part; for the pain was presently assuaged. Neither must we too long make use of repercussives; lest the matter become so hardned, that it can scarce be afterwards resolved as when it shall be concrete into knots and plaster-like-stones: resolving medicines are to be mixed with repercussives conveniently applyed, so to discuss the humor remaining as yet in the part, whereof shall be spoken in the following Chapter.

Lib. 22. cap. 25.

Phlebotomy to evacuate the conjunct matter, and assuage pain.

CHAP. XVII.

Of Local medicines for a choleriek Gout.

THe repercussives that must first be used in this kind of Gout ought to be cold and moist that so they may resist both the qualities of choler; such are the leaves of night-shade purslain, house-leek, henbane, sorrel, plantain, poppy, cold water and the like, whereof may be made divers compositions. As, R. *succi hyoscyami, sempervivi, lactuc. an.* ℥ii. *farin. hordei* ʒi. *olei rosati* ℥ii. *agitando simul fiat medicamentum*; Let it be applyed and often changed, for so at length it will assuage the inflammation. Some think the brain of a hog mixed with white starch, or barly-meal and oil of roses, an excellent medicine. The leaves of mallows boiled in water, and beaten with a pestle, and applied, assuage pain. R. *mucilag. sem. psilii extract. in aq. solani, vel rosarum* ℥ii. *farin. hordei* ℥i. *aceti q. s. fiat linimentum.* Or else, R. *unguent. rosat. mesue, & populei an.* ℥iii. *succi meloncum* ℥ii. *alb. ovorum,* nu. iii. *misceantur simul pro litu.* Also a spunge dipped in oxycrate, and pressed out again and applied thereto doth the same. Or else, R. *fol. caulium rub.* m. ii. *coquantur in oxycrato & terantur, adde ovorum vitellos tres, olei rosati* ℥iii. *farinæ hordei quantum sufficit, fingantur 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 barly-meal make a cataplasm. In winter-time, when as these things cannot be had green, you may use *unguent. infrigidans Galeni & populeon.* Or else, R. *ceræ albæ* ℥i. *croci* ℈i *opii* ℈iv. *olei rosati quantum sufficit, macerentur opium & crocus in aceto, deinde terantur & incorporentur cum cera & oleo, fiat ceratum*; spread it upon a cloth, and lay it upon the part, and all about it, and let it be often renewed. Some cut frogs open and apply them to the grieved part. It is confirmed by sundry mens experience, that pain of the *Sciatica*, when it would yield to no other remedy, to have been assuaged by anointing the affected part with the mucous water or gelly of Snails, being used for the space of seven or eight days; truth whereof was assured me by the worthy Gentleman the Lord of *Longeman*, a man of great honesty and credit, who himself was troubled for six months space with the *Sciatica*. This water is thus made, Take fifty or sixty 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 day; then press them in a coarse or hair cloth: in the expressed liquor dip linnen rags and apply them so dipped to the part affected, and renew them often. But if there be great inflammation, the Snails shall be boiled in Vinegar and Rose-water. They say that Citrons or Oranges boiled in Vinegar, and beaten in a mortar, and incorporated with a little barly or bean flower, are good against these pains. Or else, R. *pomorum cocloeum in lacte* ℔. i. *butyri* ʒi. *vitellos ovorum,* nu. ii. *aceti* ʒi. *fiat cataplasma.* There are some who take cheese-curd newly made, and mix it in a mortar with oil of Roses and barly-meal, and so apply it; it represseth inflammation and asswageth pain. Others mix *cassia* newly extracted forth of the cane, with the juice of Gourds or Melons. Others apply to the part the leaves of Coleworts, and Dane-weed or Smallage, or all three mixed together and beaten with a little Vinegar. Others macerate or steep an ounce of linseed in Wort and make the mucilage extracted therefrom into a Cataplasm with some oil of Roses and barly-meal. Some put oil of poppies to the pulp of Citrulls or Gourds being beaten, and so incorporate them together, and apply it.

What repercussives are here required.

A cerate with *opium.*

The water of Snails.

This following medicine hath its credit from a certain Gascoin of *Bassa* that was throughly cured therewith, when as he had been vexed long and much with gouty pains, above the common custom of such as are troubled with that disease. 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, lest it should burn the bed cloths, then forthwith fill the hot one with so many Dane-wort-leaves, that the patient may safely lay the affected part therein without any danger of burning it. Then let the patient endure the heat that comes therefrom, and by sweat receive the fruit thereof, for the space of an hour, substituting fresh Dane-wort-leaves, if the former become too dry; as also another hot tile, if the former shall grow too cold before the hour be ended. This being done, let the part be dried with warm and dry linnen cloths. Use this particular stove for the space of fifteen days, and that in the morning fasting; afterward anoint the part with this following ointment. R. *succi ebulli* ℔ .j. ℈. *olei com.* ℔.j. *misceantur simul,* and let them be put into a straight mouthed glass, and well luted up; then let it boil in *balneo Mariæ*, being first mixed with some Wine, until the half thereof be consumed, for the space of ten or twelve hours, then let it cool, and

An history.

A particular stove.

An ointment of the juice of Dane-wort.

and so keep it for use, adding thereto in the time of anointing, some few drops of *aqua vitæ*. It may be anointed twice or thrice in a day, long after meat. Moreover; the roots and leaves of Dane-wort boiled in water, beaten and applyed asswage pain; the oyl thereof chymically extracted performs the same.

When to use narcoticks.

But if the contumacious pain cannot be mitigated by the described remedies, and becoming intolerably hot and raging, make the patient almost to swoun; then must we flie to Narcoticks; For although the temper of the part may be weakned by these, the native heat diminished or rather extinguished; yet this is a far less inconvenience than to let the whole be wasted by pain. These things have a powerful refrigerating and drying faculty, taking away the sense of the pain, and furthermore, incrassate, thin acrid and biting humours, such as cholerick humors are. Wherefore if the matter which causeth the pain be thick, we must abstain from Narcoticks, or certainly use them with great caution. R. *micæ panis secalini parum colli in lacte*, ʒii. *vitellos ovorum*, nu. ii. *opii* ʒi. *succorum solani, hyoscyami, mandragoræ, portulacæ, sempervivi, an.* ʒi. let them be mixed together and applied, and often changed. Or else, R. *fol. hyoscyami cicutæ, acetos. an.* m. i. *bulliant in oxycrato & contundantur, cumque vitellis ovorum crudorum* nu. ii. *& olei rosat.* ʒii. *farin. hordei quod satis sit, incorporentur, fiat cataplasma*; with the use thereof I am accustomed to asswage great pains. Or else, R. *opii.* ʒiii. *camphor.* ʒβ, *olei nenuph.* ʒi. *talliis* ℥ii. *unguent. ros. Galeni* ʒiv. *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 be 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 leaves of henbane, hemlock, lettuce, purslain, being so boiled do the same. If any desire to use these more cold, he must apply them crude, and not boiled.

A cataplasm with *opium*.

But the excess of pain being mitigated, we must desist from the use of such narcoticks, and they must rather be strengthned with hot and digerating things; otherwise there will be danger left it be too much weakned, the temper thereof being destroyed, and so afterwards it may be subject to every kind of defluxion. Wherefore it shall be strengthned with the formerly discussing fomentations, and these ensuing remedies. As, R. *gum. ammoniaci & bdelii an.* ʒi. *dissolvantur in aceto, & passentur per setaceum, addendo styracis liquid. & farin. fænugr. an.* ʒβ. *pulv. ireos.* ʒiv. *olei chamæm.* ʒii. *pulveris pyrethri* ʒii. *cum cera, fiat emplastrum molle.* Or else, R. *rad. enulæ, cbuli, altheæ an.* ℥. β. *fem. lini, fænugr. an.* ʒii. *ficuum ping.* nu. xx. *coquantur completè & trajiciantur per setaceum, addendo pul. euphorb.* ʒii. *olei chamæm. anetb. & rutacei, an.* ʒiii. *medullæ cervi* ʒiv. *fiat cataplasma.* Yet you must use moderation in discussing, left the subtler part of the impact humor being discussed, the grosser part may turn into a stony consistence, which also is to be feared in using repercussives.

How to mend the harm done by Narcoticks. Discussers.

A mean to be used in discussing.

Baths asswage the pain of the Gout.

I also omitted, that according to the opinion of the Ancients, baths of fresh-water, wherein cooling herbs have been boiled, used three hours after meat, conduce much to the asswaging 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 being opened, and the humors dissipated by the gentle warmness of the bath. After the bath the body must be anointed with *hydrelium*, or oil and water tempered together, left the native heat exhale and the body become more weak. Meats of more gross juice are more convenient, as beef, sheeps-feet, and the like, if so be 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 be used in pains of the joints proceeding of a distemper only, without matter.

An history.

PAins also happen in the joints by distemper without any matter, which though rare, yet because I hapned once to feel them, I have thought good to shew what remedies I used against them. I once earnestly busied in study, and therefore not sensible of such external injuries as might befal me; a little wind coming secretly in by the crannies of my study, fell upon my left Hip; at length wearied with study, as soon as I rose up to go my way, I could not stand upon my feet, I felt such bitter pain without any swelling or humor which might be discerned. Therefore I was forced to go to bed, and calling to mind, that cold, which was absolutely hurtful to the nerves, had bred me that pain, I attempted to drive it away by the frequent application of very hot cloths, which though they scorched and blistered the found parts adjoining thereto, yet did they scarce make any impression upon the part where the pain was setled, the distemper was so great, and so firmly fixed therein. And I laid 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, rosemary, 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 very 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 be heated by the straitness and continuity of the nerves. At length, by the help of these remedies, I was very well freed from this contumacious distemper, when it had held me for the space of four and twenty hours.

Hip. ap. 10. *sect.* Divers remedies for pain arising from a cold distemper without matter.

A fuliginous vapour sometimes the cause of the Gout.

There is another kind of Gouty pain sometimes caused by a certain excrementitious matter, but so thin and subtle that it cannot be discerned by the eyes. It is a certain fuliginous or footy vapor, like

like to that which passeth from burning candles or lamps, which adheres and concretes to any thing that is opposed thereto; which being infected by the mixture of a virulent serous humor whithersoever it runneth, causeth extreme pain, some whiles in these, and otherwhiles in other joints, unless you make a way therefore, when as it seeketh passage forth, which must be done by horns cupping glasses, vesicatories, cauteries, or other the like art.

CHAP. XIX.

What is fit to be done after the fit of the Gout is over.

How to strengthen the joints.

IT is convenient when the pain is asswaged, that you strengthen the joints. Now, to strengthen them is not only to bind and dry, but wholly to amend the weakness left in the part by the disease, that is to discuss the humor, if any superfluity thereof remain; but to humect the part; if the moisture be exhausted and dryed up. But such as are troubled with the Gout, after they are freed from their pain, have notwithstanding such impotency of their joints that they cannot go of a long time after; for that the nerves and tendons which are in great number in the feet, being moistned with much Phlegm, are so relaxed, that they can no more sustain or bear themselves upon their feet, than paper when it is wet can be made stand. Wherefore, that they may recover the use of their feet, the impacted humor must by all means be discussed, and spent with fomentations, cataplasms, drying and astringent emplasters. You may use the formerly described fomentation, encreasing the quantity of alum and salt, and adding thereto a like quantity of *sulphur vivum*: then the following emplaster shall be applyed thereto. ℞. *mast. emplast. contra ruptur.* ℥iv. *tereb.* ℥ii. *pulv. ros. rub. succum express. gallarum, gran. myrtil. & fol. ejusdem, thuris, mastich. & caryophyl. an.* ℥i *malaxentur omnia simul, mamillis injunctis oleo myrtino & mastichino, fiat emplastrum.* Let it be spread upon leather to a just bigness, and applied to the top and soal of the foot. Draw over the plaster, and the whole leg a stocking made of a tanned-dogs-skin; this emplaster strengthneth the nerves, draweth forth the humor impact therein, and intercepts 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.

Remedies for the weakness left in the joints after the pain is gone.

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.*

SOme that are troubled with the Gout, have knotty bunches growing in their joints, which by the ancients 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 being too weak cannot digest and depress them; wherefore being there impact, they easily concrete into a certain plaster-like or chalk-like substance, whilest by the adventitious and burning heat caused by pain, and the gouty malignity, their more subtle part is dispersed, but the grosser subsides. Yet sometimes the unfit application of repercussive or discussive medicines is a cause of the generation of these *Tophi*. For by the former, the impact matter is incrassated and gathered together; but by the latter, the subtle part being discussed, the remnant that subsides, concretes into *Tophi*. Those medicines which are made to mollifie, ought to have a moderately heating, and humecting faculty, that they may diffuse, and as it were dissolve the impact matter; such is warm water, the decoction of emollient herbs, the decoction of calves or sheeps entrails, heads and feet: after these or the like fomentations, you shall use the following medicine. ℞. *axungiæ humanæ, anseris & gallinæ, medull. cervin. an.* ℥ii. *tereb. ven.* ℥i. *aq. vitæ parum, ceræ quantum sufficit, fiat unguentum molle.* Then this which followeth will be good. ℞. *rad. althæ, liliorum, bryon. lapath. acuti, an.* ℥iv. *coquantur complete, & trajiciantur per setaceum; adde gum. ammon. bdel. galb. opopanacis in aceto dissolutorum* ℥i. *medul. cervin.* ℥ip. *incorporentur simul, & applicentur.* Or else, ℞. *olei liliorum, amygd. dul. medullæ cruris cer. an.* ℥ii℈. *mucag. sem. lini, althææ, fænugr. an.* ℥i. *ceræ quantum sufficit; fiat ceratum.* Or else, ℞. *empl. de Vigo cum mercurio, & cerat. de aspho humidâ descript. Philagrii, an.* ℥ii. *malaxentur simul cum oleo lilior. fiat massa.* Or else, ℞. *gum. ammon. opopan. galb. bdel. dissolutorum in aceto an.* ℥ii. *panno lineo colatis, adde pulv. sulph. nitr. sinapi, pyrethri, an.* ℥i. *hypocistidis, succ. hum. an.* ℥i. *res. pini, tereb. ven. an.* ℥ii℈. *ceræ quantum sufficit, fiat ceratum molle.* This which follows is thought most effectual in the opinion of *Galen* and *Avicen*. ℞. *pedes porcel. bene salsos, nu.* iv. *veterum perunam cum illis coque; addendo sub finem, radicis bryoniæ, lapath. acut. an.* ℥iii. *axungiæ taxeri, & medull. cervi, an.* ℥i. *cum caseo putrefacto fiat empl. molle ad usum.* This which follows is also most effectual. ℞. *caseis acris & putrefacti,* ℥iv. *pulv. sulph. vivi cuphorb. & pyreth. an.* ℥iii. *decoctionis veteris perunæ & porcellorum quod sufficit ad incorporandum, dicantur in mortario, & fiat empl. ad usum.* Or else, ℞. *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 be 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 quantity of very sharp vinegar, and *aquæ vitæ*, the rising vapor shall be diligently received by the affected member, for this hath a faculty to attenuate and cut gross, viscid, and plaster-like matter, yea also, and to break the skin; yet that is broken oft times of its own accord without the help of other medicine or instrument. To conclude, those medicines which are good to mollifie scirrhous tumors, the same are also good to soften the gouty knots and *tophi*. But we must note; that these knotty bunches are sometimes suppurated, not truly by the impact and plaster-like matter, but by a new defluxion coming on a sudden, and then it is necessary to make way for the contained matter, which being done, forth there cometh forth an humor like milk, then a plaister-

Whence the *Tophi* are generated.

The unfit application of discussive and repercussive medicines cause the *Tophi*.

Mollifying medicines.

Lib. 10. simp. c. 7. fall. 2. 2 lect. 3. tract. 2. c. 21.

An effectual fumigation.

plaſter-like matter, then it leaves behind it an ulcer to be cured by applying thereto *empl. gratia Dei*, and others as the Surgeon ſhall think fit.

CHAP. XXI.

Of Flatulencies contained in the joints, and counterfeiting true Gouts, and of the remedies to be uſed thereto.

In what joints flatulencies are chiefly generated.

OFt-times there is ſmall quantity of humor, which moves the pain of the Gout but much flatulency mixed therewith, eſpecially in great joints, as in the huckle or hip-bone, and the knees; they ſometimes cauſe 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 any ſenſe of heavineſs; if when you preſs the tumor with your fingers, the place retain no mark or impreſſion thereof, as happens in an *œdema*; but on the contrary, a flatulent ſpirit lifts it up as it were by renitency, as if one ſhould thruſt a pair of bellows, which are filled with wind; hence the part cannot perform its duty, for that the ſpaces of the joints are poſſeſſed with abundance of flatulencies, ſo that the liberty of motion is intercepted, and the member is kept as it were bound up. Many no very skilful Surgeons, putting their fingers to theſe kind of tumors, ſo that lifting up the one, they preſs down the other, when as they perceive the flatulency, as it were riſing between their fingers, ſuppoſing it to be the motion of *pus*, or matter already generated and 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 cauſed many dangerous ſymptoms: as increaſe of pain, defluxion of humors, by force whereof the bones have been diſlocated, and brought to the patient an incurable lameneſs. But theſe flatulent Gouts are ſeldom without ſome plegmatick matter; which is neither too crude nor viſcid. Such like flatulencies are not eaſily diſcuſſed, nor at the firſt endeavour, by reaſon of a cold diſtemper which they bring to the part, and the denſity of the membranes and ligaments, by which the articulation is knit and faſtned, ſo that ſcarce any part of that which is there ſhut up, can breath forth of ſuch ſtrait paſſages. Therefore the cure muſt be undertaken with reſolving, diſcuſſing, and drying fomentations; as for example, with a decoction of fennel, aniſ-ſeeds, rue, camomil, melilote, ſage, roſemary, *origanum*, calamints, hore-hound, and the like, boiled in wine with a little lee, roſe-vinegar, and common ſalt. This following ointment ſhall be uſed after the fomentation. ℞ *olei chamæm. aneth. rut. lauri, an.* ℥ij. *cum cerâ albâ, fiat linimentum. addendo aq. vitæ parum.* After you have anointed it, apply thereto this following Cataplaſm. ℞ *flor. cham. melil. aneth. roſ. rub. pulv. an.* m.j. *fol. malv. & abſinth, an.* m.ſ. *furfur.* m.j. *buliant omnia ſimul cum lixivio, & vino rubro, deinde pistentur cum medulla panis, & farina faborum, quantum ſufficit, fiat cataplaſma, addendo ol. roſar. & myrtil. an.* ℥ij. Some highly approve of this following medicine for the waſting of flatulencies. ℞ *axung. ſuil.* ℥iv. *calcis vivæ,* ℥iſ. *terantur diligenter in mortario, & incorporata applicentur.* Or elſe, ℞ *ſtercor. caprar. coctis cum vino & aceto, an.* lbſ. *tereb. venet. & mel. com. an.* ℥ij. *aq. vitæ,* ℥ſ. *pul. rad. Ireos florent. & ſabin. an.* ℥iij. *olei. rut. & aneth. an.* ℥j. *farin. faborum quantum ſufficit.* Make a cataplaſm to the form of a pultis. Alſo ſtoups dipped in oxycrate, and wrung out, ſhall be applied: in this oxycrate ſhall be boiled wormwood, *origanum*, chamomil, melilote, rue, common ſalt, adding thereto ſome *aqua vitæ*. Then the part ſhall be bound up as ſtraight as the patient can endure it: in concluſion that the native ſtrength may by little and little be reſtored to the part, it ſhall be fomented with lee made of the aſhes of oak-wood and the cuttings of vines, wherein ſhall be boiled ſalt, ſulphur, choice alum; and wetting linnen clothes, or ſtoups therein, and applying them, it ſhall be ſtraitly ſwathed up. Yet if great pain ſhall more cruelly vex the part, then neglecting for a time the proper cure of the diſeaſe, you ſhall withſtand the ſymptom by rubbing the part, and anointing it with ſome diſcuſſing oil laying thereon ſome moiſt wool, and other anodyne things.

How flatulencies may make you believe 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 other cauſes, bitterneſs of pain, and vehemency of other ſymptoms, eaſily exceeds the other kinds 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 than the reſt; becauſe alſo the phlegmatick humor which cauſeth it, is commonly more plenteous, cold, groſs, and viſcid, that flows down into this joint: and laſtly, becauſe the *Sciatica* commonly ſucceeds ſome other chronical diſeaſe, by reaſon of the tranſlation and falling down thither of the matter, become malign and corrupt by the long continuance of the former diſeaſe. But the pain not only troubles the hip, but entring deep, is extended to the muſcles of the buttocks, the groins, knees, and very ends of the toes, yea often times it vexeth the patient with a ſenſe of pain in the very *vertebra* of the loins, ſo that it makes the patients, and alſo oft-times the very Phyſicians and Surgeons to think it the wind or ſtone-colick. The cauſe of ſuch wandring and diſperſed pain is to be referred to the manifold diſtribution of the nerves which come to that joint from the loins and *huly-bone*, for they are ſent into the muſcles of the buttocks, and ſo diſperſed over the whole leg to the very ends of the toes, as it is ſhewed in our Anatomy. Therefore the pain is largely extended, that is, to what part ſoever a nerve runs which comes from the affected hip. Oftentimes there is no ſwelling, no redneſs, nor diſtemper manifeſt to the eye, by reaſon that the veins are very few which riſe into the ſurface and

The cauſe of the large ſpreading of the pain.

skin

skin of this part, and the humor lies, as it were, ſunk in; which is the cauſe that divers times the excrementitious humors mixed with flatulency, run ſo violently into the cavity 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 be reſtored again, if it remain ſo for any ſpace of time; for that in this time the humor falling down into this cavity, by delay concretes as it were into a ſtony body, and the head of the thigh-bone wears it ſelf another cavity in the neighbouring bone; but the lips of the true cavity, which are griſtly, become more ſtraight and depreſt: and laſtly, all the ligamentous bodies moiſtened with this excrementitious humor become more looſe and weak, whence ſucceed many and moſt grievous ſymptoms; as lameneſs, and the decay not only of the thigh and leg, but at length of the whole body; and laſtly, a ſlow and hectick feaver, which in continuance of time will conſume the Patient for the cauſes 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* be commonly occaſioned by tough phlegm, yet if the patient be ſtrong, and abound with blood, and all things elſe conſent, it ſhall be good to draw blood by opening a vein; for phlebotomy equally evacuates all humors: therefore the falling down of the humors into the part affected, is thereby hindred or retarded. Verily, I have known no ſpeedier remedy to aſſwage the pain of inflammation, than blood-letting, being firſt made on the *Baſilica* of the grieved ſide for revulſions 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* be more on the out-ſide; or elſe on the *Sapheia*, which is on the inſide of the ankle, if the inner parts be more pained. The quantity of blood which is to be drawn, muſt be left to the judgment of the Phyſician, without whoſe advice I would attempt nothing in this caſe. Alſo acrid clyſters are good, if there be nothing which may hinder; as ulcers of the guts, or hemorrhoids. ℞ *rad. acor.* ℥ij. *centaur. rut. ſalv. roriſm. calam. origan. puleg. an.* m. ß. *ſtœchad. arabic. floeham. melil. anneth. an.* p.j. *ſem. aniſ. & fœnic. an.* ℥ ß. *fiat decoctio ad* ℔j. *in colatura diſſolve hieræ & diaphen. an.* ℥ ß. *mellis anthoſ. ſacch. rub. an.* ℥j. *olei liliorum* ℥iij. *fiat clyſter.* Strong purgations are alſo here uſeful, as of *pillul. fœtid. arthritic. Aſſajereth de Hermodactylis*, and others uſed in phlegmatick cauſes. *Electuarium Diacarthami* purgeth choler and phlegm. Often vomitings do not only evacuate the humors, but alſo make revulſion, as we have formerly delivered. Baths and ſweats profit no otherwiſe than a decoction of *Guaiacum* or *Sarſaparilla*. If heat moleſt the part, then foment it with oil of roſes and vinegar, eſpecially if the pain be deep in, for vinegar by its tenuity piercеth to the bottom, and makes way for the oil, which of its own nature is anodyne. After the uſe of general medicines, you ſhall apply attractive and reſolving things: emplaſters of pitch and ſulphur, or of *ammoniacum, euphorbium, 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, roſemary, Pellitory of Spain, and other ſuch like do the ſame, which by reaſon of the tenuity of their ſubſtance, and their ſeparation from earthy impurity, have far more powerful and expedite faculties to penetrate and diſcuſs. Yet muſt you uſe none of all theſe without very good judgment and deliberation, otherwiſe there will be danger of inflammation.

Why we muſt open a vein in the *Sciatica*.

When the *vena Iſchiadica* and *Sapheia* muſt be opened in the *Sciatica*.

Strong purgations in the *Sciatica*.

There may alſo be made fomentations of diſcuſſing and reſolving herbs, as the roots and leaves of dane-weeds, orris, bay and juniper-berries, the ſeeds of fenugreek, anis, fennel, the leaves of ſage, roſemary, chamomil, melilote, elder, and the like, boiled in wine and oil; the following plaſter is much commended by the ancients to digeſt, or reſolve and aſſwage the pain, with this which draws forth thorns, ſplinters, and rotten bones. ℞. *ſem. urtic. mundat. ſtumæ boræ. ſalis ammoniaci, rad. ariſtoloch. rotund. colocinth. terebinth. venet. an.* ℥.x. *fœnug. piperis longi, xylobalſam. thuris, myrrhæ, adipis cap. gum. pini, an.* ℥.v. *ceræ* ℔ ß. *lactis ficus ſylv.* ℥ ß. *ex omnibus ſecundum artem præparatis cum olei liliorum, & vini generoſi quantitate ſufficiente fiat emplaſtrum.* Let it be applied to the hip. Or, ℞ *ſinapi acerrimo aceto diſſoluti,* ℥ij. *fermenti acris,* ℥ ß. *pul. hermodact.* ℥ij. *mellis com.* ℥iij. *tereb.* ℥iv. *olei laur. & de ſpica. an.* ℥ij. *far, fœnug.* ℥i ß. *terræ formicarum cum ovis,* ℔j. *fol. laur. ſalv. rut. roriſm. an.* m. ß. *vermium terreſt. præpar.* ℔ ß. The earth with the eggs and worms ſhall be boiled apart with the white wine, and herbs cut in pieces, and theſe being ſtrained out, the reſt of the things ſhall be added according to art, and then it ſhall be applied to the hip. Or elſe, ℞ *rad. enul. camp. ſigil. Salom. bryon. biſtnal. an.* ℥ij. *coquantur complete & terantur, trajiciantur per ſetaceum, addendo farin. fœnug. & hordei, an.* ℥j. *olei liliorum, & chamæm. an.* ℥iij. *tereb.* ℥iv. *ceræ quantum ſufficit, fiat cataplaſma.* It reſolves, aſſwageth pain, and calleth forth the humors to the skin. Or elſe, ℞. *rad. ſigil. beatæ Mariæ,* ℥vj. *empl. diachyl. albi,* ℥iv. *croci in aqua vitæ diſſoluti,* ℥ij. *terebinth.* ℥j. *ol. de ſpica nardi quantum ſufficit, fiat empl.* Let it be 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 Briony cut into ſlices, and applied, when the matter was cold. Or elſe, ℞ *ceræ citrin. & tereb. abiet. an.* ℥ij. *liquefiant ſimul in vaſe duplici, & ubi refrixerint, adde pulv. hermodact.* ℥ ß. *flor. chamæm. irid. flor. an.* ℥iij. *ſpicæ nardi, flor. thymi, an.* ℥ij. *interioris cinamomi electi. & ſemin. naſturt. an.* ℥ij. *croci,* ℈iv. *malaxantur ſimul manibus axungia porci vetere non ſalitâ unctis, & fiat maſſa empl.* But if the pain be not by this means aſſwaged, then muſt we come to powerful medicines, as to uſe great cupping-glaſſes applied with much flame, and to veſicatories: As, ℞. *cantharid. quibus detractæ ſunt alæ,* ℥ii. *ſtaphiſagr.* ℥iij. *ſinapi* ℥i ß. *fermenti acerrimi* ℥ ß. *incorporentur ſimul, & fiat veſicatorium.* Alſo bliſters may

Black briony diſcuſſeth.

A ſtrong veſicatory.

The inner rind of Travellers-joy a veſicatory.

may be raiſed by applying the inner rind of Travellers-joy to the weight of ſome 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 be kept open for ſome time after, and ſo more of the humor contained in the part may be drawn away. But if we cannot avail by theſe means, we muſt according to *Hippocrates* his counſel, come to the laſt and extremeſt remedy. *Such* (ſaith he) *as are troubled with a long pain of the* Sciatica, *have their hip fall out of joint, their leg conſumes, and they become lame, unleſs they be burnt.* We have alſo read the ſame approved by *Celſus*. *It is the laſt* (ſaith he) *and moſt effectual medicine in longer diſeaſes, to cauterize with hot irons, the skin of the hip in three or four places; and then not heal up theſe ulcers or fontanels as ſoon as may be, 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, mercury, and the like catheretick, until the affect againſt which we uſe this remedy, be helped, for by this means many have been helped.* Therefore three or four actual canteries, or hot irons ſhall be thruſt in, about the joint of the hip, that they may enter into the fleſh ſome fingers breadth, yet ſo that you ſhun the nerves. Cauteries here do good, for that by heating the part, they heat and diſſolve 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 ſtrengthened by their cicatrization, and their looſeneſs helped, and by this means the whole part is notably corroborated.

Hip. ult. ſect. 6.

Lib. 4. cap. 22.

The uſe of cauteries in the *Sciatica*.

CHAP. XXIV.

Of the flatulent convulſion, or convulſive contraction, which is commonly called by the French, Gout Cramp, *and by the Engliſh,* The Cramp.

What the Cramp is.

THat which the French call *Gout Cramp*, we here intend to treat of, induced thereto rather by the affinity of the name, than of the thing; for if one ſpeak truly, it is a certain kind of convulſion generated by a flatulent matter, by the violence of whoſe running down or motion, oft-times the neck, arms, and legs are either extended, or contracted into themſelves with great pain, but that for a ſhort time. The cauſe thereof is a groſs and tough vapor, inſinuating itſelf into the branches of the nerves, and the membranes of the muſcles. It takes one on the night, rather than on the day, for that then the heat and ſpirits uſually retire themſelves into the entrails and centre of the body; whence it is that flatulencies may be generated, which will fill up, diſtend and pull the part whereinto they run, juſt as we ſee lute-ſtrings are extended. This affect often takes ſuch as ſwim in cold water, and cauſeth many to be drowned, though excellent ſwimmers, their members by this means being ſo ſtraightly contracted, that they cannot by any means be extended: For the skin, by the coldneſs of the water is contracted and condenſed, and the pores thereof ſhut, ſo that the engendred flatulencies have no paſſage forth. Such as give themſelves to drunkenneſs and gluttony, or ſloth and idleneſs, are uſually more frequently troubled with this diſeaſe, by reaſon of their heaping up of crudities. Therefore it is cured by moderate diet, and ordering of the body, and exerciſe of each part thereof; for thus they gather ſtength, and the generation of the flatulent matter is hindred. In the very time when it takes one, the patient ſhall be cured by long rubbing with warm cloths, and *aqua vitæ*, wherein the leaves of ſage, roſemary, thyme, ſavory, lavendar, cloves, 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 cauſe thereof.

Who ſubject thereto.

The cure.

The end of the Eighteenth Book.

BOOK XIX.

Of the LUES VENEREA, *and thoſe Symptoms which happen by means thereof.*

CHAP. I.

What the *Lues Venerea* is.

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 makes no great matter how it be called, if the thing it ſelf be underſtood: Therefore the *Lues Venerea* is a diſeaſe gotten or taken by touch, but chiefly that which is in unclean copulation; and it partakes of an occult quality, commonly taking its original from ulcers of the privy parts, and then further manifeſting it 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 cauſeth knots and hard *tophi*: and laſtly, corrupts and fouls the bones, diſſolving them, the fleſh about them being oft-times 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 ſome loſe one of their eyes, others both: Some loſe

What hurt it doth to the Body.

loſe a great portion of their eye-lids, other ſome look very gaſtly, and not like themſelves, and ſome become ſquint-eyed. Some 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. Some have their mouths drawn awry, others their yards cut off, and women a great part of their privities tainted with corruption. There be ſome, 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, ready 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 become lame of their arms, and other ſome of their legs, 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 feaver, and ſlow conſumption? it fares far worſe with theſe, who have all their bodies deformed by a leproſie ariſing there-hence, and have all their throttles and throats even with putrid and cancrous ulcers; their hair falling off from their heads, their hands and feet cleft with tetters and ſcaly chinks: neither is their caſe much better, who, having their brains tainted with this diſeaſe, have their whole bodies ſhaken by fits of falling-ſickneſs; who troubled with a filthy and curſed flux of the belly, do continually caſt forth ſtinking and bloody filth. Laſtly, there are no kinds of diſeaſes, no ſorts of ſymptoms, wherewith this diſeaſe is not complicate, never to be taken away, unleſs the virulency of this murrain be wholly taken away, and impugned by its proper antidote, that is, *argentum vivum*.

The Leproſie ſometimes the off ſpring of the *Lues Venerea*.

CHAP. II.

Of the cauſes of the Lues Venerea.

THeſe are two efficient cauſes of the *Lues venerea*; the firſt is, a certain occult and ſpecifick quality which cannot be demonſtrated; yet it may be referred to God, as by whoſe command this hath aſſailed mankind, 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 be moleſted with a virulent ſtrangury (which diſeaſe crafty Whores colour by the name of the whites) the malignity catcheth hold of the other; thus a woman taketh this diſeaſe by a man, caſting it into her hot, open and moiſt womb; but a man taketh it from a woman, which for, example ſake, hath ſome ſmall while before received the virulent ſeed of a whore-maſter polluted with this diſeaſe, the mucous *ſanies* whereof remaining in the wrinckles of the womans womb, may be drawn in by the pores of the ſtanding and open yard, whence ſucceed malign ulcers, and a virulent ſtrangury. This virulency, like a torch or candle ſet on fire, will by little and little be propagated and ſent by the veins, arteries and nerves to the noble parts; whoſe maligniy a ſtrong liver not enduring, by the ſtrength of the natural expulſive faculty, will ſend it into the groins, whereon follow abſceſſes, therefore called *Venereal Buboes*. Theſe if they return in again, and caſt not forth matter by being opened, 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 diſeaſe may be got by a more occult manner of touch, as by breathing only. For it is not altogether beſide reaſon and experience, that a woman long troubled with this diſeaſe, may by importunate and often kiſſing, transfuſe malignity into a child; for the tender and ſoft ſubſtance of a little child may be altered, infected, and by little and little corrupted by receiving of filthy, and in their whole kind malign vapors. For it is known, and now vulgarly believed, that mid-wives, by receiving the child of a woman infected with this diſeaſe, have got this affect, the malignity being taken and drawn into their bodies through the pores of their hands by the paſſage of the veins and arteries. Neither doth it ſpare any condition, ſex, nor age of men: for not only whoſoever uſe copulation, but ſuch as only lie with them, may be taken with this virulency; yea verily, if they only lie in the ſheets or coverings which retain his ſweat, or the virulency 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 diſeaſe: For by the impure touch of their lips, they leave a virulent *ſanies* and ſpittle upon the edges of the cup, which is no leſs contagious in its kind, than the virulency of leprous perſons, or the ſome of mad dogs. Wherefore it is no marvel if children nurſed by an infected nurſe, draw in the ſeeds of this diſeaſe together with the milk, which is only blood whitened in the breaſts; or infected ſucking children by their hot and ulcerated mouths, may transfuſe this malignity into the body of the nurſe, by the rare, looſe and porous ſubſtance of the dugs which it frequently ſucketh.

The *Lues Venerea* the ſcourge of Whoremongers.

Venereal buboes returning in again, occaſion the *Lues venerea*.

The *Lues venerea* may be got by the only communication of vapor.

How nurſes may infect children, and they their nurſes.

This following hiſtory is very memorable to this purpoſe. A certain very good Citizen of this City of *Paris* granted to his wife, being a very chaſte woman, that conditionally ſhe ſhould nurſe her own child, of which ſhe was lately delivered, ſhe ſhould have a nurſe in the houſe to eaſe her of ſome part of the labour: by ill hap, the nurſe they took was troubled with this diſeaſe; wherefore ſhe preſently infected the child, the child the mother, the mother her husband, and he two of his children, who frequently accompanied him at bed and board, being ignorant of that malignity wherewith he was inwardly tainted. In the mean while the mother when ſhe obſerved that her nurſe-child came not forward, but cried almoſt perpetually, ſhe asked my counſel to tell her the cauſe of the diſeaſe; which was not hard to be done, for the whole body thereof was repleniſhed with venereal ſcabs and puſtles, the hired nurſes and the mothers nipples were eaten in with virulent ulcers; alſo the fathers, and the two other childrens bodies, whereof the

An hiſtory.

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 nurse. I had them in cure, and by Gods help healed them all, except the sucking child, which died in the cure. But the hired nurse was soundly lashed in the prison, and should have been whipped through all the streets of the City, but that the Magistrate had a care to preserve the credit of the unfortunate family.

CHAP. III.

In what humor the malignity of the Lues Venerea *resides.*

THough in the opinion of many the antecedent cause of this disease be the mass of blood containing the four humors, yet I had rather place the matter, and primary and chief seat thereof in gross and viscid phlegm infected with the malign quality of the venereous venom, and from this beginning and foundation; I think by a certain contagious growth, it sooner or later infects the other humors, as each of them is disposed or apt to suffer: Of which my opinion there are many 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 sover, whether cholerick, sanguine or melancholick, the disease is helped or cured. Secondly, for that the excess of pain is more by night than by day, because then the phlegm bearing sway, severs the *periosteum* from the bone, or else offends it and the rest of membranous and nervous bodies by the acrimony of its malignity. Thirdly, because the patients are hurt by the use of cold things, but usually find benefit by hot medicines, whether they be ointments, plaisters, fumigations, or whatsoever else, 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 being opened, you shall find them stuffed with a certain plaister-like and tophous matter, or else with rough phlegm, or viscous *pus*; whence arise these hard *tophi*, or bony 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 disease. Sixthly, for that the ulcers which over-spread the body, by reason of this disease, admit of no cure, unless you cause sweats. Therefore if the matter of the disease, and such ulcers as accompany it, were hot and dry, it would grow worse, and be rather increased by a decoction of *Guaiacum*, the roots of *China*, or *Sarsaparilla*. Seventhly, because oft-times this disease, the seed thereof being taken or drawn into the body, so lieth hid for the space of a year, that it shews no sign thereof, which happens not in diseases proceeding from a hot matter, which causeth quick and violent motions. By this it appeareth that the *Basis* and foundation of the *Lues Venerea* is placed or seated in a phlegmatick humor: yet may not deny, but that other humors confused therewith may be also in fault, and defiled with the like contagion. For there are scarce any tumors which proceed from a simple humor, and that of one kind, but as in tumors, so here the denomination is to be taken from that humor which carrieth the chief sway.

Why the pain is worse upon the night, than on the day.

The disease sometimes lies long hid in the body before it shews 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 strangury runneth oft-times with filthy *sanies*, which proceeds either from the *prostatæ*, or the ulcers of the *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 weary without a cause, so that neither the foot nor hand can easily perform his duty; their mouths are inflamed, a swelling troubles their throats, which takes away their freedom of speaking and swallowing, yea of their very 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 body; yet all of these use not to appear in all bodies, but some of them in some. But the most certain signs of this disease 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 be cicatrized, it retain the same callous hardness; the Buboes or swellings in the groins to return back into the body without coming to suppuration or other manifest cause, these two signs, if they concur in the same patient, you may judge or foretel that the *Lues venerea* is either present, or at hand; yet this disease happeneth to many without the concourse of these two signs, which also bewraieth it self by other manifest signs, as ulcers and pustles in the rest of the body, rebellious against medicines though powerful, and discreetly applyed, unless the whole body be anointed with *Argentum vivum*. But when as the disease becometh inveterate many become impotent to venery, and the malignity and number of the symptoms increase, their pains remain fixed and stable, very hard and knotted *tophi* grow upon the bones, and oft-times they become 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 seized upon by an *ophiasis* and *alopecia*; whitish tumors with roots deep fastned in, arise in sundry parts of the body, filled with a matter like the meat of a chesnut, or like a tendon; if they be opened they degenerate into divers ulcers, as putrid, eating and other such, according to the nature and condition of the affected bodies. But why the pains are more grievous on the night season, this may be added to the true reason we rendred in the precedent Chapter, first, for that the venereous virulency lying as it were asleep is stirred up and enraged by

The most certain signs of the *Lues venerea*.

Two other causes of the excess of pain in the night.

by the warmneſs of the bed and coverings thereof; ſecondly, by reaſon of the Patients thoughts which on the night ſeaſon are wholly turned and fixed upon the onely object of pain.

CHAP. V.

Of Prognoſticks.

The ſigns of a curable *Lues Venerea.*

IF the Diſeaſe be lately taken, aſſociated by a few ſymptoms, as with ſome ſmall number of puſtles, and little and wandring pains, and the body beſides be young and in good caſe, and the conſtitution of the ſeaſon be good and favourable, as the Spring, then the Cure is eaſie, and may be happily performed. But on the contrary, that which is inveterate and enraged by the fellowſhip of many and malign ſymptoms, as a fixed pain of the head, knots and rottenneſs of the bones, ill-natured ulcers in a body very much fallen away and weak, and whereof the cure hath been already ſundry times undertaken by Empericks, but in vain; or elſe by learned Phyſicians, but to whoſe remedies, approved by reaſon and experience, the malignity of the diſeaſe and the rebellious virulency hath refuſed to yield, is to be thought incurable, eſpecially if to theſe ſo many evils this be added, that the Patient be almoſt waſted with a conſumption and hectick leanneſs, by reaſon of the decay of the native moiſture. Wherefore you muſt onely attempt ſuch by a palliative cure; yet be wary here in making your Prognoſticks: for many have been accounted in a deſperate caſe, who have recovered; for by the benefit of God and Nature, wonders oft-times happen in diſeaſes. Young men who are of a rare or lax habit of body, are more ſubject to this diſeaſe, than ſuch as are of a contrary 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 accompany with ſuch who have the *Lues Venerea*, are alike infected or tainted. The pains of ſuch as have this diſeaſe, 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 always like themſelves; Gouty pains poſſeſs the joints, and in theſe condenſe a plaſter-like matter into knots; but thoſe of the Pox are rather faſtned in the midſt of the bones, and at length diſſolve them by rottenneſs and putrefaction. Venereous ulcers which are upon the Yard, are hard to cure, but if being healed, they ſhall remain hard and callous, they are ſigns of the diſeaſe lying hid in the body.

The ſigns of an incurable one.

How theſe pains differ from thoſe of the Gout.

Generally, the *Lues Venerea* which now reigneth is far more mild and eaſie to be cured then that which was in former times, when as it firſt began amongſt us: beſides, each day it ſeemeth to be milder than other. Aſtrologers think the cauſe hereof to be this, for that the celeſtial influences which firſt brought in this diſeaſe, in ſucceſs of time by the contrary revolutions of the Stars, loſe their power and become weak, ſo that it may ſeem ſomewhat likely, that at length after ſome few years it may wholly ceaſe; no otherwiſe than the diſeaſe termed *Mentagra*, which was very like this in many ſymptoms, and troubled many of the *Romans* in the reign of *Tiberius*; and the *Lichen*, which in the time of *Claudius* (who ſucceeded *Tiberius*) vexed not onely *Italy*, but all *Europe* beſides: Yet Phyſicians had rather take to themſelves the glory of this leſs raging diſeaſe, and to refer it to the many and wholſom means which have been invented, uſed and oppoſed thereto by the moſt happy labours of noble Wits.

The *Lues Venerea* becomes more gentle than formerly it was.

CHAP. VI.

How many, and what means there are to oppugn this Diſeaſe.

MAny ſorts of remedies have been found out by many to oppugn and overcome this Diſeaſe. Yet at this day there are onely four which are principally uſed. The firſt is by a decoction of *Guaiacum*, 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 *Guaiacum* hath not ſufficient ſtrength to extinguiſh the venom of the venereous virulency, but onely to give it eaſe for a time; for becauſe it heats, attenuates, provokes Sweat and Urin, waſtes the excrementitious humours by drying them; it ſeemeth to cure the diſeaſe, for that thereupon for ſome time the pain and all other ſymptoms ſeem more remiſs: but theſe endeavours are weak and deceitful, as whereby that onely which is more ſubtle in the humours in fault, is exhauſted and diſperſed by ſweat. But *Hydrargyrum* is a certain higher power, contains therein all the power of *Guaiacum*, yet much more excellent and efficacious; for beſides that it heats, attenuates, cuts, reſolves and dries, it provokes Sweat and Urin, and beſides it expels noxious humours 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 diſeaſe is properly fixed; are diſperſed and evacuated; by which the Phyſician may be bold to aſſure himſelf of certain victory over the diſeaſe. But after the uſe of the decoction of *Guaiacum*, freſh pains and knots ariſe by the reliques of the more groſs and viſcous humours left in the cavities of the entrails; but *Hydrargyrum* leaves no reliques behind it.

Why the decoction of *Guaiacum* is not ſufficient to impugn the diſeaſe.

Hydrargyrum is ſufficient to overcome the diſeaſe.

CHAP. VII.

How to make choice of the Wood Guaiacum.

THat is preferred before the reſt which is of a great log, of a duſky colour, new, gummy, with a freſh ſtrong ſmell, an acrid, and ſomewhat biting taſte, the bark cleaving very cloſe to the Wood. It hath a faculty to heat, rarifie, attenuate, attract, to cauſe Sweat, and move Urin,

The faculty.

The parts.

Urin, and besides by a specifick property to weaken the virulency of the *Lues Venerea*. 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 dusky part thereof. The bark is more dry, wherefore you shall use it when as you would dry more powerfully; the middle substance is more moist, because it is more succulent and fat; that which lieth between both, is of a mild temper: wherefore the two last are more convenient for delicate Natures and rare Bodies, which require less drying. Furthermore, the bark must be given to dense and strong Natures, that by the more fiery force thereof, the humours may be made more fluid, and the passages of the body more passable. But I would here be understood to mean such bark as is not putrid and rotten with age, to which fault it is very subject, for that long before it be shipped by our people, the wood lieth in heaps upon the shore in the open air, until they can find 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 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 Cellers 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 hot and fiery faculty of the bark.

CHAP. VIII.

Of the preparation of the decoction of Guaiacum.

The proportion of the *Guaiacum* to the Water.

First you must have your *Guaiacum* shaved into small pieces, and to every pound of the shavings, add of fair water eight, ten, or twelve pints, more or less, as the nature of the party, and condition of the disease shall seem to require, according to the rule of the formerly mentioned Indications. Let the Water be hot or warm, especially if it be in Winter, that so it may the more easily and throughly enter into the body of the wood, and draw into it self the faculties thereof in the space of twenty four hours, wherein it is macerated, then boil it in *balneo*, to avoid *Empyreuma*, or taste of fire, which it will contract by boiling it over a hot fire. Yet some 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 be made, let it be boiled to the consumption of half, a third, or fourth part, as the nature of the Patient and Disease shall seem to require. There be some who mix divers Simples therewith, which have an occult and proper sympathy with that part of the body which is principally hurt by the Disease, which at the least may serve in stead of a vehicle to carry the faculties of the decoction thither where the disease most reigneth. Others add thereto purging Medicins, whose judgment I cannot approve of, for that I think it is not for the Patients good to attempt two evacuations at once; that is, to expel the humours by Sweat by the habit of the body, and by purging by the belly; for that as much Urin, so also much Sweat shews little evacuation by Stool. For these two motions are contrary, which Nature cannot brook at once: For Purging draws from the Circumference to the Center, but Sweat runs a quite contrary course, and this is the opinion of many and great Physicians. This first decoction being boiled out and strained, the like quantity of Water shall be put to the stuff, or mass, that so being boiled again without any further infusion, and strained, with the addition of a little Cinamon for the strengthening of the Stomach, the Patient may use it at his meals, and between his meals (if he be dry) for his ordinary drink. The quantity of the first decoction to be taken at once, ought to be some five or six ounces, and it shall be drunk warm, that so it may be the sooner brought into action, and lest the actual coldness should offend the stomach; and then the Patient being well covered, shall keep himself in bed, and there expect sweat, which if it come slowly on, it shall be helped forwards with stone-bottles filled full of Water, and put to the soals of the feet. If any parts in the *interim* shall be much pained, they shall be comforted by applying of Swines bladders half filled with the same decoction heated. Neither will it be unprofitable before the decoction be drunk, to rub over all the body with warm linnen cloths, that by this means the humours may be attenuated, and the pores of the skin opened. When he shall have sweat some two hours, the parts opposite to the grieved places shall first be wiped, then presently, but more gently, the grieved parts themselves, lest a greater conflux of humours flow thereto. These things being done, he shall keep himself in bed, shunning the cold air until he be cooled and come to himself again, some two hours after he shall so dine, as the disease and his former custom shall seem to require; six hours after, betaking himself to his bed, he shall drink the like quantity of the decoction, and order himself as before. But if he be either weak, or weary of his bed, it shall be sufficient to keep the house without lying down; for although he shall not sweat, yet there will be a great dissipation of the vapours and venenate spirits, by insensible transpiration; for the *Lues Venerea* by the onely communication of these, often times catcheth hold, and propagates it self in lying with a bedfellow tainted therewith. But it is requisite to have let blood, and purge the body by the advice of a Physician, before the taking of the decoction of *Guaiacum*; so whilest he doth take it, it much conduceth to keep the belly soluble (which is much bound by the heat and driness of such a drink) and to preserve the purity of the first Veins by a Clyster, or laxative Medicin taken every fifth or sixth day. But for the use of it, we must warily observe, taking indication, not onely from the malignity and contumacy of the disease, but also from the particular nature of the Patient; for such as have their body wasted by heat and leanness, and their skin dry and scaly (whence you may gather a great adustion of the humours, and as it were, a certain incineration of the habit of the body) must more sparingly make

Whythe decoction ought to be performed with a dry heat.

Whether it be fit to add purges to a decoction of *Guaiacum*.

Hip. aph. xlv. sect.6.

How, and in what quantity this decoction must be taken

How to dry the sweat of the body.

How long this decoction must be used.

make use of these things, but rather temper the body by humecting things taken inwardly, and applied outwardly, as Baths, Ointments without Quick-silver, and other such like things: And then a very weak decoction of *Guaiacum* shall be used for a few days before your unction with Quicksilver. A more plentiful diet, as it draws forth the disease, which of its own nature is long, so a more sparing and slender diet makes the ulcers more rebellious and contumacious, by a hectick driness. The manner of Diet.

Therefore a middle course must be kept, and meats made choice of, which are fit and naturally engender good and laudable juice in the body. For it is not onely great ignorance, but much more cruelty to go about to contain all Patients without any difference, within the straight allowance of four ounces of Ship-bisket, and twelve damask Prunes: for I judge it far better to diet the Patient with Lamb, Veal, Kid, Pullets, fat Larks, and Black-birds, as those which have a greater familiarity with our bodies, than Prunes and the like Junkets. Let his bread be made of white wheat well leavened, neither too new, or tough, neither too old or hard. Let his drink be made of the mass or strainings of the first decoction of *Guaiacum* boiled with more water, as was formerly mentioned; yet if there arise any great weakness of the faculties, you may permit the use of some 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. Pathons or perturbations of the mind must also be avoided, for that by these the spirits are inflamed and dissipated; all the delights of honest pleasure are to be desired, but venery wholly avoided, as that which weakens all the nervous parts. To whom, and what manner of Wine may be allowed.

Many in stead of a decoction of *Guaiacum*, use a decoction of *China*. Now this *China* is the root of a certain Rush, knotty, rare, and heavy when it is fresh, but light when it is waxed old; it is also without smell, whence many judge it void of any effectual quality, it is brought into use out of *India*, it is thus prepared, it is cut into thin round slices, boiled in Fountain or River Water, and is given to Patients to drink morning and evening after this manner. ℞ *Rad. chin. in taleol. sect.* ℥ ij. *aquæ font.* ℔ xij. *infundantur per hor.* xij. *& coquantur ad consumption. tertiæ partis.* Let him take ℥ vj. in the morning, and so much at night; let him expect a sweat in his bed: a second decoction may be made of the mass remaining of the first, but with a less quantity of water put thereto, which also by longer boiling may draw forth the strength remaining in the mass, and be used at meals for ordinary drink. There are some who make a third decoction thereof, but that is wholly unprofitable and unuseful. *Sarsaparilla* is prepared also just after the same manner. The description of *China*. The preparation. Of *Sarsaparilla*.

CHAP. IX.

Of the second manner of curing the Lues Venerea, *which is performed by Friction or Unction.*

THe Cure of the *Lues Venerea* which is performed by Unction and Friction is more certain, yet not in every kind, condition, and season thereof. For if the disease be inveterate from an humour, tough, gross, viscous, and more tenaciously fixed in the solid parts, as you may gather by the knotty tumours of the bones; for then we are so far from doing any good with a Friction used at the first, that on the contrary, we bring the Patient in danger of his life, unless we shall have first prepared the tumor to expultion, by emollient and digesting things first used. But if it be lately taken with moveable pains, pustles, and ulcers in the jaws, throat, and privy parts, then may it be easily cured without such preparatives, especially if the humour be sufficiently obedient, and as it were prepared of it self, and its own nature. Therefore first using general medicins, you may afterwards come to use the Unction with *Hydrargyrum*. When the body must be prepared with humecting things before unction.

CHAP. X.

Of the choice preparation and mixing of Hydrargyrum.

HYdrargyrum which is clear, thin, white, and fluid, is the best: on the contrary, that which is livid, and not so fluid, is thought to be adulterated, by the admixture of some Lead. That it may be the purer, strain it through some sheeps-leather, for by pressing it when it is bound up, it passeth through by its subtilty, and leaves the filth and leaden dross behind it on the inside: Then it may be boiled in Vinegar, with Sage, Rosemary, Thyme, Camomil, Melilot, and strained again, that so many ways cleansed, it may enter into Ointments and Plasters. To kill it more surely, it shall be long wrought, and as it were ground in a Mortar, that it may be broken and separated into most small particks, that by this means it may not be able to gather it self into the former body: to which purpose you may also add some *sulphur* or *sublimate*, as we shall shew hereafter. It is most usually mixed with Hogs-grease, adding thereto some Oil of Turpentine, Nutmegs, Cloves, Sage, and *Galens* Treacle. If a *Leucophlegmatia* together with the *Lues Venerea* affect the body, then hot, attenuating, cutting and drying things shall be added to the Medicin, which shall be provided for Unction; the same shall be done when as we would have it to enter into the substance of the bones. But if the Patient be of a cholerick temper, and his bloud easie to be inflamed, you shall make choice of less hot attractive and discussing things; as when the body shall be replenished with knotty and scirrhous tumours, 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 Egs. Therefore this shall be the form of the Ointment called Vigoes. ℞ *Axung. porci,* ℔ j. *olei chamæm. anethi, mastich. & laurini an.* ℥ j. *styrac. liquid.* ʒ x. *rad. enulæ c.m. parum tritæ, & ebuli, an.* ʒ iij. *pul. euphorb.* ℥ ß. *vini odorif.* ℔ j. *bulliant omnia simul usque ad consumptionem vini, deinde colentur; colaturæ adde lythargyri auri* ℥ vj. *thuris, mastich. an.* ʒ vj. *ref. pini,* ℥ j. ℣. *terebinth. venet.* ℥ j. *argenti vivi,* ʒ iv. *ceræ albæ,* ʒ j. ℣. *liquefactis oleis, cum cera incorporentur omnia simul, fiat linimentum ad usum.* Or else ℞ *Argenti vivi præparati,* ℥ vj. *sublimati,* ʒ ß. *sulphuris vivi,* ℥ ℣. *axung. porci salis experti* An unction with *argentum vivum*. Another.

expertis, ℔ j. *vitellos ovorum sub cineribus coctorum*, nu. iij. *olei terebinth. & laurini, an.* ʒ ij. *theriac. vet. & mithridat.* ʒ ß. *fiat linimentum ut artis est.* You shall compose it thus, first the *sublimatum* and *sulphur* shall be finely powdered, then some part of the *Argentum vivum* and Hogs-grease put to them, then presently after, some of the hard yolks of Eggs, continually and diligently stirring and mixing them all together. All these being well incorporate, add some more *Argentum vivum*, Hogs-grease, and yolks of Eggs, and incorporate them with the former; at last add the Oils, then Treacle and Mithridate, and so let them be all beaten together for a whole days space, and thus you shall make an ointment of a good consistence, which I have often used with good success. Yet the Hogs-grease shall be first boiled with the hot herbs good for the sinews, as Sage, Rosemary, Thyme, Marjerom, Lavender, and others which the Season affords. For so the *axungia* acquires a more attenuating faculty, and consolidating of those parts which the *Lues Venerea* afflicts. Besides, when unguents are made for this purpose, that such virulency may be drawn from within outwards, by sweats and transpiration through the pores of the skin, no man need doubt but that they ought to be furnished with relaxing and rarifying and attractive faculties. But *axungia*, besides that it is very fit to kill the *Argentum vivum*, it also relaxeth and mollifieth. Now *Oleum laurinum, de spica, rutaceum*, rarifie, digest, and asswage pain, Turpentine also extinguisheth and bridleth the *Argentum vivum*, moderately heats, resolves, and strengthens the nervous parts. But *Argentum vivum* is the proper antidote of the *Lues Venerea*, as that which cures it howsoever used, drying by the subtilty of the parts, and provoking sweat. Verily Treacle and Mithridate somewhat conduce to retund the virulency of this disease, but unless *Argentum vivum* assist as a ferret to hunt, and an *Alexiterium* to impugn the disease, they can do no great matter.

How to make it.

How to prepare the hogs-grease before you mix the *argentum vivum* therewith

CHAP. XI.

How to use the Unction.

THe body and humours apt to cause or nourish a *plethora* or inflammation, being prepared by digestive syrups, and evacuated by purging and bleeding as is fitting, according to the direction of some Physician, the Patient shall be shut up in a Parlour or Chamber, hot either by Nature or Art, and free from cold blasts of wind; for cold is most pernicious in this disease, both for that it hurts the nervous parts, already ill-affected by reason of the disease, as also for that it lessens the efficacy of Medicins. Wherefore many do ill in this, who, whether in Winter or Summer anoint their Patients in a large room, exposed on every side to the winds. They deal somewhat more wisely, who put a cloth fastned like half a Tent presently behind the Patient, though anointed by the Fire side, so to keep away the cold air from him. Yet it is the safest to set, and anoint the Patient either in a little Room, or else in some corner of a large Room, separated from the rest of the Room by some hangings, and building a stove, or making some fire therein, for so he may stand or sit as he best likes, the longer, and with the less offence, and be equally heated on every side; whereas such as are anointed in a Chimney by a fires-side cannot but be heated unequally, being ready to burn on the one side, whilest the other is cold, which motions are contrary hurtful to that we require: besides, if the Patient shall be weak he cannot stand and endure the heat of the fire. Or if he be shame-faced, he will be unwilling to shew all his body at once naked to the Surgeon, but he may without any harm, and with modesty, lying on a Bed in a little Room wherein a stove is made, have all his limbs anointed about the joints, and presently bound up, either with stoups, or carded cotten, or brown paper.

Cold most hurtful to such as are troubled with the *Lues Venerea.*

CHAP. XII.

What cautions to be observed in rubbing or anointing the Patient.

HE shall be anointed orrubbed over with the Ointment in the morning, the concoction and distribution of the meat being perfected, which functions otherwise would not be well performed, the powers of Nature being distracted into several operations: Yet if the Patient shall be weak, you may some hour before the unction give him some Gelly, the yolk of an Egg, or some Broth made of Meat boiled to pieces, but very sparingly, lest Nature intent upon the concoction of solid Meats, or in great quantity, should be drawn away from that which we intend. At first let onely the joints of the limbs be anointed, as about the Wrists, Elbows, Knees, Ankles, Shoulders. But afterward, if the Patient shall be more strong, and a greater commotion of the humours and body seem necessary; the emunctories of the principal parts may also be anointed, and the whole spine of the back; yet having much care, and always shunning the principal and noble parts, lest we should do as those butcherly Empericks do, who equally, and in like manner daub and rub over all the body, from the soles of the feet to the crown of the head: moreover, diligent regard must be had of those parts which are seized upon by the symptoms of this disease, that they may be more anointed, and that it may be more throughly rubbed in. Yet you may always begin your anointing or rubbing at those parts which are less offended, lest the humours should be drawn in greater measure to the grieved part. And as gentle frictions do not sufficiently open the pores of the skin, so more strong and hard ones shut them up, cause pain, and more plentifully attract the morbifick matter. Wherefore it will be more convenient to use moderate frictions, taking indication from the strength of the Patient, as that whereto we must still have the chief regard. There is also another thing whereto the Physician and Surgeon must diligently attend, as that, which if it be not carefully prevented, will either hasten the death of the Patient, or make him subject to a relapse; that is, the quantity of the remedies and unctions, and the number

The Patient, if it may be conveniently done, must be anointed fasting.

In what places the body must be anointed.

Where to begin the Unction.

number of the frictions. Which conſideration, together with that which is of the degrees of the temperaments of the whole body, and each part thereof, much troubles the minds of good Phyſicians, and maketh the Art conjectural. It is far from being attained to by Empericks; yet we muſt endeavour by Method and Reaſon, that by the Rule of Indications ſo frequently mentioned, we may attain to the knowledge thereof, as near as may be: for to have perfect knowledge hereof, and to ſay that thoſe need onely four, others five, and otherſome ſix, more or fewer frictions at the beginning, which Empericks, commonly do, is a thing both impoſſible and vain. All theſe muſt be changed and ordered according to the malignity and continuance of the diſeaſe, and the condition of the affected bodies. Verily we muſt ſo long uſe frictions and unctions, until the virulent humours be perfectly evacuated by Spitting and Salivation, by Stool, Urin, 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 diſeaſe. In many, by reaſon of the more denſe and compact habit of the body Nature is more ſlow in excretion. Yet I have learnt by long experience, that it is beſt to anoint and chafe ſuch twice in a day, to wit Morning and Evening, ſix hours after meat. For ſo you ſhall profit more in one day, then by the ſingle friction of three days. But on the contrary, I have often, and with good ſucceſs, rubbed over but each other day more rare and delicate bodies, giving them one or two days reſt to recollect their ſtrength, which by the too much diſſolution of their ſpirits becoming too weak, were not ſufficient to expel the reliques of the morbifick matter. And certainly about the end of the appointed friction, eſpecially when as the Patient begins to flux at the mouth, the bodies, together with the noxious humours 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* bids, when as the diſeaſe is great, and the ſtrength of the Patient infirm, that we ſhould part our bloud-lettings, and draw a little and a little at once; ſo alſo here, when as we ſhall obſerve Nature ſtirred up, and ready bent to any kind of evacuation by the Mouth, Stool, or other like; you ought not to uſe any Unction or Friction oftner than once in a day; yea, certainly it will be better to intermit for ſome few days. For thus *Maſſa* reports, that there was a certain man who almoſt waſted with a Conſumption, being continually afflicted with the moſt grievous pains of this diſeaſe, and reputed in a deſperate caſe by other Phyſicians, was notwithſtanding at length recovered by him, when as he had anointed him thirty ſeven times, putting ſome time between for the recovery of his ſtrength. I my ſelf have obſerved others, who thus, by the interpoſition of one or two days, being rubbed over for fifteen or ſeventeen times, have perfectly recovered. Where you muſt take this courſe in reſolved and weak bodies, yet in the *interim* muſt you have a care that the frictions be not too weak and ſo few, that the morbifick cauſe may not be touched to the quick: for in this kind of diſeaſe Nature doth not of it ſelf endeavour any *criſis*, or excretion; it requires the auxiliary forces of Medicins, by whoſe aſſiſtance it may expell all the malignity. Theſe are ſigns of ſuch a *criſis*, either at hand or already preſent, if the Patient be ſo reſtleſs, ſo loath all things, that he cannot remain in one place either ſtanding or lying; he can neither eat nor drink, if he be oppreſſed with a continual wearineſs, almoſt ready to ſwound, yet have a good and equal pulſe, and gripings in his belly afflict him, with bloudy and viſcous dejections, until at length Nature after one or two days portion of the morbifick matter being ſpent, be ſomewhat freed, and all pains and ſymptoms ſo much abated, as the excretions have proceeded. But whereas Medicins are not ſufficient in number or ſtrength, there follows an imperfect *criſis*, which leaves behind it ſome reliques of the morbifick matter, which like leven do ſo by little and little infect the whole maſs of the humours, that oftimes after ten years ſpace the diſeaſe riſeth as out of an ambuſh, or lurking-hole, and becomes far worſe than before. But we muſt in like manner have a care left theſe Medicins, that are either given inwardly, or applied outwardly, be not too ſtrong: for by cauſing ſuch colliquation of the radical moiſture and ſolid parts, many have been brought into an incurable conſumption. In others forſooth did and putrid ulcers have thence ariſen in the mouth, which having eaten a great part of the Palate and Tongue, have degenerated into a deadly *Cancer*. In others hereupon the tongue hath ſo ſwelled up, that it hath filled the whole capacity of the mouth, ſo that it could not be bended to any part of the mouth for chawing, whereupon they have by little and little, been famiſhed. In other ſome there hath been cauſed ſo great colliquation of humours, that for a whole moneth after tough and filthy ſlaver hath continually flowed out of their mouths. Other ſome have the muſcles of their jaws relaxed, others troubled with a Convulſion, ſo that during the reſt of their lives they can ſcarce gape. Others by loſing a portion of their jaw, have loſt ſome of their teeth. But you muſt not always ſo long anoint and chafe the body, until a flux of the mouth or belly appear: For you may find ſundry perſons, who if you ſhould anoint or rub them to death, you cannot bring them to flux at the mouth; yet theſe will recover notwithſtanding, excretion being made either by inſenſible tranſpiration, or evacuation of Urin, or ſome gentle flux of the belly, either procured by Art, or coming of it ſelf. In which caſe I have obſerved that many have received much good by a purging decoction of *Guaiacum*, adminiſtred according to the quantity of the peccant humour, and given for ſome days in the morning, adding thereto white Wine, if the body abounded with tough and viſcid humours. Dyſenteries, or bloudy Fluxes cauſed by Unctions, may be helped by Clyſters, wherein much Hogs-greaſe is diſſolved to retund the acrimony cauſed by the Medicin and humour which nouriſheth the Dyſentery. Alſo new Treacle diſſolved in new milk, is thought wonderfully to mitigate this ſymptom.

What it is that maketh the Art of Phyſick conjectural.

Who muſt be rubbed over once, who twice in a day, and who but every other day.

Lib. de vent. ſect.

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 purging decoction of *Guaiacum* is good.

The cure of a Dyſentery occaſioned by too ſtrong friction.

CHAP. XIII.

Of the third manner of Cure, which is performed by Cerates and Emplaſters, as ſubſtitutes of Unctions.

The cure by Emplaſters more ſlow.

FOr that ſundry 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 ſomewhat 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 diſeaſe, ſymptoms, humours, and Patient, never omitting *Hydrargyrum*, the onely antidote of this diſeaſe. Such Emplaſters mitigate pains, and knots, and reſolve all hardneſs, and are abſolutely very effectual; for continually ſticking to the body, they continually operate:

In what caſe they are chiefly uſeful.

Wherefore they are of prime uſe in relapſes of this diſeaſe, or when the humours are thick and viſcous, or otherwiſe lie deep in the body, and very difficult to root out. But for that they work more ſlowly oft-times, ſuch as uſe them are forced at length to uſe ſome frictions to ſtimulate Nature, and cauſe the ſpeedier excretion. Yet in ſome, whole bodies and humours have been fluid, either by Nature or Art, the applied Emplaſters have in three days ſpace procured evacuation ſufficient for the diſeaſe, ſo that if they had not been taken away, they would have cauſed a colliquation, like that which we lately mentioned in too violent friction: Wherefore you ſhall uſe the like diſcretion in taking of

The deſcription of an Emplaſter.

theſe, as you uſe in your unctions and friction. In ſtead of *Emp. de Vigo*, this following may be fitly uſed. ℞ *Maſſæ Emp. melil. & oxyer. an.* ℔ ß. *argenti vivi extin.* ʒ vj. *oleo laurino, & deſſica reducantur ad formam emplaſtri.* Theſe Plaiſters muſt be equally ſpread upon leather, and laid upon the ſame places of the joints, as were formerly mentioned in the cure by frictions. Yet ſome there be who cover with the plaiſter 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 be that the places or the joints be covered over with a thicker Plaiſter. They muſt be left ſticking thereon ſo long, until Nature be ſtirred up and provoked to cauſe excretion of the virulent humours. Yet if in the *interim*, great itching ſhall ariſe in the parts, you may take them off ſo long until the parts ſhall be fomented with a decoction of the flowers of Camomil, Melilot, red Roſes, and the like, made in Wine, to diſcuſs that which cauſed the itching, and then you may lay them on again. Some to hinder the riſing of any itch, lay not the bare Plaiſter to the part, but cover it over with Sarcenet, ſo to keep it from ſticking, and thus intercept the tranſpiration of the part, the cauſe of itching. They ſhall be ſtronger or weaker, and lie to the part a long 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 cauſe excretion, one while by inſenſible tranſpiration, otherwhiles by a *Diarrhœa*, or flux of the belly; ſometimes by Urins, but moſt frequently (which *Criſis* is alſo moſt certain) by ſalivation. Sordid and virulent ulcers often breed in the Mouth, Tongue, Pallat, and Gums by ſalivation, by reaſon of

What excretion beſt in this diſeaſe.

the acrimony of the virulent humours adhering to the ſide of the mouth: to hinder the growth of theſe, many inject Clyſters made of emollient things, eſpecially at the beginning of the ſalivation, ſo to draw downwards the humours forcibly flying up in greater quantity than is fit, although the part it ſelf may endure them.

There are alſo ſome, who to the ſame end give a purging Medicin at the very time when as the humours are ready to move upwards, the which I think is not a ſafe courſe. The cure of ſuch ul-

To avoid the ulcers of the mouth.

cers is far different from the cure of others; for they ought by no means to be repercuſſed or repelled, how inflamed ſoever they be, but onely to be 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

To cure them.

humours to ſuch like ulcers. A decoction of Barley, Cows 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 Barley, Mallows, and Pellitory of the Wall, are good for this purpoſe; for thus the ulcers become more mild, and the tenacity of the adherent humours is looſed. You muſt at the firſt beware of ſtrong detergent Medicins, for almoſt all ſuch have acrimony joined with them, which will increaſe the pain, but chiefly in the ſtate of the diſeaſe: for ſo, the ulcers gently cleanſed by frequent gargling, would become worſe by the uſe of acrid things. Therefore it ſhall be ſufficient to make uſe of the fore-mentioned Medicins, ſo to hinder the increaſe of the filth, and inflammation of the ulcers, if ſo be that ſuch ulcers be not too exceeding malign and burning. For if it ſhall happen either by the powerful efficacy of the applied Plaſters, or by the violence of Nature in its motion of the ill humours upward, that ſuch ſtore of viſcous and groſs humours are carried to the mouth, that it wants little, but that the part it ſelf is over-ruled by the morbinck matter, ſo that by the violence and continuance of the flux, the Mouth and Jaws become ſo ſwelled, that a gangrene is to be feared, by

Reſtrictive repelling Gargariſms.

hindring the entrance of the ſpirits, and extinguiſhing of the native heat of theſe parts. In this caſe we are forced to leave the proper cure for to withſtand the accidents, and for this purpoſe we uſe reſtrictive and repelling things, ſuch as are Barley Water, Plantain, Night-ſhade, Knot-graſs, Shepherds-purſe, and the like; with ſyrup of Roſes, Violets, Quinces, Berberies, Pomgranats, and the like; alſo ſuch are the mucilages and decoctions of the ſeeds of Lettuce, Pſilium, Quinces, Plantain, Night-ſhade, Water-lillies, Wood-bind, &c. Alſo it is convenient to procure ſweats by Stoves, or the application of any hot and dry things; for thus the humours which run forth of the veſſels into all the ſurface of the body, are diverted. But when as the courſe of the humours running to the mouth, is begin-

To dry the ulcers of the mouth.

ning to ſtop, and the tumours of ulcers begin to leſſen, then nothing hinders, but that we may uſe gently detergent things, as *Syrup. roſarum ſiccar. mel roſat. Diamoron, Diacaucum*, and the like. But when it is time to dry the ulcers, they may be lightly touched with Alum-water, or with *Aqua fortis*, ſuch as Goldſmiths have uſed for the ſeparation of Metals. They may alſo frequently uſe drying

Gargariſms

Gargarisms made with astriction of the water of Roses, Plantain, Night-shade, Shepherds-purse, Knot-grass, and Dogs-tongue, boiling therein *balaust. ros. rub. myrtil. sumach. alum. acacia, berber. galar. malicor.* and the like. During 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 he can neither chaw, swallow, nor digest hard things: For Nature wholly intent upon the excretion of the noxious and peccant humours, 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 he shall be fed with rear new-laid Egs, Candles of the same, Barley-creams, Cullesses made of a decoction of Knuckles of Veal, and a Capon, and Gellies; and with these in small quantity, but frequantly administred, always gargling his mouth before he eat. For his drink he shall use a decoction of *Guaiacum* aromatized with a little Cinamon; but if any desire that the drink shall become nourishment; for that the Patients cannot feed on more solid meats, you may give them old Wine, Claret and thin, mixed with some Barley-water. Some there are who steep some crums of pure Manchet in the forsaid Wine, and then press it out, but yet so, that there may some 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 comes over is more strong and hot; but that which flows out afterwards, more mild, and such as the Patient may use to mix with his Wine without any danger, for his better nourishment, and the recovery of his strength.

Manner of diet when the mouth is ulcerated.

To make their drink nourish.

For to refresh the spirits in fear of fainting, Muscadine, Hippocras, Rose Vinegar, and the like, put to the nose to smell to, will be 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 belly, that you keep it open by gentle and emollient Clysters.

CHAP. XIV.

Of the fourth manner of Curing the Lues Venerea.

SOme have devised a fourth manner of curing the *Lues Venerea*, which is by *Suffitus*, or Fumigations. I do not much approve hereof, by reason of sundry 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 during the residue of their lives, have stinking breaths. Yea many 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, Apoplexy, and lastly, miserable death, by reason of the malign vapours of Sulphur and Quicksilver, whereof *Cinnabaris* consists, drawn in by their mouth, nose, and all the rest of the body. Wherefore I can never approve the use of such fumigations which are to be received in fumes by the mouth and nostrils for to work upon the whole body; yet I do not dislike of that which is undertaken for some one part onely, as to dry up ill-conditioned ulcers, which so affect it, they cannot be overcome by any other means, or for to disperse or digest knots, or to resolve fixed pains, otherwise unmoveable. These Fumigations, by reason of the admixture of *argentum vivum*, have an attenuating, cutting, resolving, and colliquating faculty. Those who prepare these Fumigations for the cure of the whole disease and body, take this course. They put the Patient under a Tent or Canopy made close on every side, lest any thing should expire, and they put in unto him a Vessel filled with hot coals, whereupon they plentifully throw *Cinnabaris*, that so they may on every side enjoy the rising fume, just after the same manner as Farriers use to smoak their Horses for the Glaunders: they repeat this every day so long, until they begin to flux at the mouth. The principal matter or *basis* of such Fumigations, as we have already noted, is *Cinnabaris* consisting of Sulphur and *argentum vivum* mixed together: there is added also, *Radix iridis flor. thus, olibanum myrrha, juncus odoratus, assa odorata, masticbe terebinthina & thuriaca*, all which have a faculty to resolve and strengthen the Spirits and Nature, and correct the stench and evil quality 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 fixt after this manner, let some Lead be melted, and let there be poured or put thereto some *argentum vivum*, then let it all be powdered, adding thereto Antimony, Aloes, Mastich, Coperas, Orpiment, and Benjamin made into Powder, and framed into Trochisces with some Turpentine. Or else ℞ *Cinnabaris* ʒ j. *styracis liq. & calamitæ, nucis moschat. an.* ʒ iij. *benzoini* ℥ ß. *excipe terebinth. fiant trochisci ponderis* ʒ ij. for the aforesaid use. The *terebinthina* is added to incorporate the dry things, and the gums are added to yield matter to the fume. But virulent ulcers of the *Lues Venerea* shall not be fumigated before they be cleansed; also this following Fumigation is good. ℞ *Cinnab.* ℥ j. *benzoini, myrrhæ, styracis, olibani, opopanacis, an.* ℥ ß. *masticbes, macis, thuris, an.* ʒ ij. *excipiantur terebinth. & fiat suffumigium.*

The hurt that follows upon Fumigations.

What fumigations 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 disease may grow all over the Yard; but these are far more malign which arise upon the Prepuce, than those that grow on the *Glans* or Nut of the Yard. Now they are rebellious to the common Medicins of Ulcers which happen otherways, and they are also subject to turn into a Gangrene, so that sundry who have not in time provided for themselves by the use of *argentum vivum*, are forced for their negligence, to suffer the loss of their *Glans*, and oft times of their whole Yard. Yet I am of opinion, that I think we must begin the cure of Ulcers

The Ulcers of the prepuce more malign than those of the *Glans*.

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 we shall find that we do no good by this means, and that the disease notwithstanding grows worse and worse, then must we come to make use of such things as receive *argentum vivum*, that by these we may resist the virulency which is ready to disperse it self over all the body; yet it is absolutely necessary that all these things be endued with such faculties as may return the malign acrimony of this venom, such an one is this following *collyrium* of

Lanfranks Collyrium.

Lanfrank. ℞ *Vini albi*, ℔ j. *aq. ros. & plantag. an.* quart 1. *auripig.* ʒ ij. *viridis æris*, ʒ j. *aloes, myrrhæ, an.* ʒ ij. *terantur subtilissime, & fiat collyrium.* Also these ulcers may be profitably touched with Mercury water, or *aqua fortis* which the Goldsmiths have used, or else Mercury in Powder, or our *Ægyptiacum:* but the falling away of the Eschar shall be procured with *basilicon*, or fresh butter. Yet I think it not fit to use these acrid things without very great caution, for fear of a Gangrene, which easily happens to this part: but if such Ulcers are so stubborn, that they will not yield to these remedies, then must we come to the friction or unction of the groins, *perinæum*, and ulcers, with the Ointments formerly prescribed for the general friction. Also Fumigations may be made, as we mentioned in the former Chapter: For thus at length the malignity of the virulent humour will be overcome, and the callous hardness mollified; and lastly, the Ulcers themselves cleansed, and being cleansed, consolidated. Sometimes after the perfect cure of such Ulcers, there will appear manifest signs of the *Lues Venerea* in many, which shewed not themselves before, for that the virulency flowed forth of the running Ulcers, and now this vent being stopt, it flows back into the body, and shews signs thereof in other parts; and these men have need of a general Unction.

CHAP. XVI.

How a Gonorrhœa *differeth from a* * *Virulent Strangury.*

* This which by our Author is here termed *Strangoria virulenta*, and in French *Chaudepisse*, is the same which by other Authors is usually termed *Gonorrhœa virulenta*, and by us vulgarly in English, *The Running of the Reins.*

EVen to this day very many have thought that the virulent Strangury hath some affinity with the *Gonorrhœa* of the Ancients, but you shall understand by that which follows, that they are much different. For a *Gonorrhœa* is an unvoluntary effusion of seed running from the whole body to the genitals, by reason of the resolution and palsie of the retentive faculty of these parts, as it is delivered by *Galen, lib. de loc. affect.* This disease befalleth others by the collection of the bloud and seminal matter by the Vessels of the whole body, which not turning into fat and good flesh, takes its course to the genitals; but on the contrary, a virulent Strangury is a running, or rather dropping out of the urinary passage, of a yellowish, livid, bloudy, filthy *sanies*, like to *pus*, or matter not well concocted, oftentimes fretting and exulcerating the passage with the acrimony, and causing a painful erection of the Yard, and distension of all the genital parts. For in this erection there is caused 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 draws the yard as it were downwards. The cause hereof is a gross and flatulent spirit, filling and distending by its plenty, the whole channel or hollow nerve, yea verily, the whole porous substance of the Yard. If to these symptoms this be added, that the urinary passage be exulcerated, a grievous pain afflicts the Patient whilest he makes water, for that the Ulcers are irritated by the sharp Urin passing that way. Such a virulent Strangury, or Running of the Reins oft-times 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 body to an extreme and deadly leanness, for that the matter of the Seed is of the more benign and laudable portion of the bloud, as you may perceive 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 becometh dull. By this we have delivered, it may be perceived that the running of virulent Strangury, is not the running of a seminal humour, fit for generation of issue, but rather of a viscous and acrid filth, which hath acquired a venenate malignity by the corruption of the whole substance.

What a virulent Strangury is.

The cause of the convulsive distension of the Yard.

Vid. aut. defin. med. apud Galen.

What kind of matter floweth forth in a virulent Strangury.

CHAP. XVII.

Of the Causes and Differences of the Scalding or Sharpness of the Urin.

THe heat or scalding of the Water, which is one kind of the virulent Strangury, ariseth from some one of these three Causes; to wit, Repletion, Inanition, and Contagion. That which proceeds from Repletion, proceeds either from too great abundance of bloud, or by a painful and tedious Journey in the hot Sun, or by feeding upon hot, acrid, diuretick, and flatulent Meats causing tension and heat in the urinary parts, whence proceeds the inflammation of them and the genital parts; whence it happens that not onely a seminal, but also much other moisture may flow unto those 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 Venery causeth this plenitude in some who have usually had to do with Women, especially the expulsive faculty of the seminal and urinary parts being weak, so that they are not of themselves able to free themselves from this burden: For then the suppressed matter is corrupted, and by its acrimony contracted, by an adventitious and putredinous heat, it causeth heat and pain in the passage forth. The *Prostatæ* swelling with such inflamed matter, in process of time become ulcerated, the abscess being broken. The purulent *sanies* dropping and flowing hence alongst the urinary passage causes the Ulcers by acrimony, which the Urin falling upon, exasperates; whence sharp pain, which also continueth for some short time after making of water, and together therewith by reason of the inflammation, the pains attraction, and the vaporous spirits distension, the Yard stands, and is contracted with

The cause of a particular repletion of the privy parts.

with pain, as we noted in the former Chapter. But that which happens through inanition, is acquired by the immoderate and unfit use of Venery, for hereby the oily and radical moisture of the fore-mentioned Glandules is exhausted, which wasted, and spent, the Urin cannot but be troublesome and sharp by the way to the whole *Urethra*. From which sense of sharp pain, the scalding of the Urin hath its denomination. That which comes by contagion, is caused by impure copulation with an unclean person, or with a woman, which some short while before hath received the tainted seed of a virulent person, or else 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 infects the whole body with the like contagion, no otherwise then the sting of a Scorpion or *Phalangium*, by casting a little poison into the skin, presently infects the whole body, the force of the poison spreading farther than one would believe, so that the party falls down dead in a short while after. Thus therefore the seminal humour contained in the *prostatæ*, is corrupted by the tainture of the ill, drawn thence by the Yard, and the contagion infects the part it self; whence follows an abscess, which casting forth the virulency by the urinary passage, causeth a virulent strangury, and the malign vapour carried up with some portion of the humour unto the entrails and principal parts, cause the *Lues Venerea*.

The causes of the inanition of the genital parts.

The reason of a contagious Strangury.

CHAP. XVIII.

Prognosticks in a virulent Strangury.

We ought not to be negligent or careless in curing this affect, for of it proceed pernicious accidents, as we have formerly told you, and neglected, it becomes uncurable, so that some have it run out of their urinary passage during their lives; oft-times to their former misery is added a suppression of the Urin, the *prostatæ* and neck of the bladder being inflamed and unmeasurably swelled. Copulation, and the use of acrid or flatulent meats increase this inflammation, and also together therewith cause an *Ischuria* or stoppage of the urin; they are worse at the change of the Moon: certain death follows upon such a stoppage; as I observed in a certain man, who troubled for ten years space with a virulent Strangury, at length died by the stoppage of his water. He used to be taken with a stopping of his urin as often as he used any violent exercise, and then he helped himself by putting up a silver Catheter, which for that purpose he still carried about him; it happened on a certain time that he could not thrust it up into his bladder, wherefore he sent for me, that I might help him to make water, for which purpose when I had used all my skill, it proved in vain: when he was dead and his body opened, his bladder was found full, and very much distended with urin, 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 virulency flows from the *prostatæ*, which runs forth of the Yard in a virulent Strangury, and not from the Reins, as many have imagined. Certainly a virulent Strangury, if it be of any long continuance, is to be judged a certain peculiar *Lues Venerea*, so that it cannot be cured unless by fictions with *Hydrargyrum*. But the ulcers which possess the neck of the bladder are easily discerned from these which are in the body or capacity thereof. For in the latter the filth comes away as the Patient makes water, and is found mixed with the Urin, with certain strings or membranous bodies coming forth in the urin: to these may be added, the far greater stench of this filth, which issueth out of the capacity of the bladder. Now must we treat of the Cure of both these Diseases, that is, the *Gonorrhœa* and virulent Strangury; but first of the former.

A virulent Strangury continues with some during their lives.

An History.

From what part the matter of a virulent Strangury flows.

CHAP. XIX.

The chief heads of curing a Gonorrhœa.

Let a Physician be called, who may give direction for purging, bleeding, and diet, if the affect proceed from a fulness and abundance of bloud and seminal matter; all things shall be shunned which breed more bloud in the body, which increase seed, and stir to venery. Wherefore he must abstain from Wine, unless it be weak and astringent, and he must not onely eschew familiarity with women, but their very pictures, and all things which may call them to his remembrance, especially if he love them dearly; strong exercises do good, as the carrying of heavy burdens even until they sweat, swimming in cold water, little sleep, refrigerations of the loins and genital parts, by anointing 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 faculty of these parts be the cause of this disease, contracted by too much use of venery before they arive at an age fit to perform such exercise; in this case strengthening and astringent things must both be taken inwardly, and applied outwardly. But now I hasten to treat of the virulent Strangury, which is more proper to my purpose.

Diet.

For a Strangury occasioned by repletion.

For the decay of the retentive faculty.

CHAP. XX.

The general Cure both of the scalding of the Water, and the virulent Strangury.

We must diversly order the Cure of this Disease, according to the variety of the Causes and Accidents thereof. First, care must be had of the diet, and all such things shunned as inflame the bloud, or cause windiness; of which nature are all diuretick and flatulent things, as also strong and virulent exercises. Purging and bleeding are convenient, especially if fulness

Diet.

neſs cauſe the affect. Womens companies muſt be ſhunned and thoughts of venereous matters; the Patient ought not to lie upon a ſoft bed, but upon a quilt or mattrice, and never, if he can help it, upon his back: boiled meats are better than roſted, eſpecially boiled with Sorrel, Lettuce, Purſlain, cleanſed barley, and the four cold ſeeds beaten: for ſauce, let him uſe none, unleſs the juice of an Orange, Pomgranate, or Verjuice: let him ſhun Wine, and in ſtead thereof uſe a decoction of Barley and Licorice, an *hydromel*, or *hydroſaccarum*, with a little Cinamon, or that which is termed *Potus divinus*. In the morning let him ſup of a Barley Cream, wherein hath been boiled a *nodulus* of the four cold Seeds beaten together with the ſeeds of white Poppy; for thus it refrigerateth, mitigateth, and cleanſeth; alſo the ſyrups of Marſh-mallows and Maiden-hair are good. Alſo purging the belly with half an ounce of *Caſſia*, ſometimes alone, otherwhiles with a dram, or half a dram of Rhubarb in powder put thereto, is good. And theſe following Pills are alſo convenient. ℞ *Maſſæ pilul. fine quibus ☽ j. rhei electi ʒ ß. camphoræ gr. iv. cum terebinthina formentur pilulæ*; let them be taken after the firſt ſleep.

Pills.

The force of Venice Turpentine in this diſeaſe.

Venice Turpentine alone, or adding thereto ſome Rhubarb in powder, with Oil of ſweet Almonds newly drawn without fire, or ſome ſyrup of Maiden-hair, is a ſingular Medicin in this caſe, for it hath an excellent lenitive and cleanſing faculty, as alſo to help forwards the expulſive faculty to caſt forth the virulent matter contained in the *Proſtatæ*. You may by the bitterneſs perceive how it reſiſts putrefaction, and you may gather how it performs its office in the Reins and Urinary parts, by the ſmell it leaves in the Urin after the uſe thereof. But if there be any 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 Apothecary, who kept it as a great ſecret. If the diſeaſe come by inanition or emptineſs, it ſhall be helped by fatty injections, oily and emollient potions, and inwardly taking and applying theſe things which have the like faculty, and ſhunning theſe things which cauſed the diſeaſe. How to cure that which happens by contagion, or unpure copulation, it ſhall be abundantly ſhewed in the enſuing Chapter.

How to be made potable.

CHAP. XXI.

The proper Cure of a virulent Strangury.

An injection to ſtay inflammation.

FIrſt, we muſt begin with the mitigation of pain, and ſtaying the inflammation, which ſhall be performed by making injection into the *Urethra* with this following decoction warm. ℞ *Sem. pſilii, lactucæ, papav. albi, plantag. cydon. lini, hyoſcyami albi an.* ʒ ij. *detrahantur mucores in aquis ſolani & roſar. ad quantitatem ſufficientem, adde trochiſc. alborum Rhaſis camphoratorum in pollinem redactorum,* ʒ j. *miſce ſimul, & fiat injectio frequens:* For this becauſe it hath a refrigerating faculty, will help the inflammation, mitigate pain, and by the mucilaginous faculty lenifie the roughneſs of the *Urethra*, and defend it by covering it with the ſlimy ſubſtance, againſt the acrimony of the Urin and virulent humours. In ſtead hereof you may uſe Cows milk newly milked, or warmed at the fire. Milk doth not only conduce hereto, being thus injected, but alſo drunk, for it hath a refrigerating and cleanſing faculty, and by the ſubtilty of the parts it quickly arrives at the urinary paſſages. Furthermore, it will be good to anoint 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 anoint the Cods and Yard. But before you uſe the aforeſaid Ointments, or the like, let them be melted over the fire, but have a care that you make them not too hot, leſt they ſhould loſe their refrigerating quality, which is the thing we chiefly deſire in them. Having uſed the aforeſaid ointment, it will be convenient to apply thereupon ſome linnen cloths moiſtned in oxycrate, compoſed *ex aquis plantaginis, ſolani, ſempervivi, roſarum*, and the like. If the Patient be tormented with intolerable pain in making water, and alſo ſome ſmall time after, as it commonly cometh to paſs, I would with him that he ſhould make water, putting his Yard into a Chamber-pot filled with milk or water warmed. The pain by this means being aſſwaged, we muſt come to the cleanſing of the ulcers by this or the like injection: ℞ *Hydromeltis ſympt.* ʒ iv. *ſyr. de roſis ſiccis, & de abſinth. an.* ʒ ß. *fiat injectio.* But if there be 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 be very good for this purpoſe. ℞ *Vini albi odoriferi,* ℔ ß. *aquar. plantag. & roſ. an.* ʒ ij. *auripigmenti,* ʒ ß. *viridis æris,* ʒ j. *aloes opt.* ʒ ß. *pulveriſentur pulveriſanda, & balſam. ſimul.* Keep the decoction for to make injection withall. You may increaſe or diminiſh the quantity and force of the ingredients entering into this compoſition, as the Patient and Diſeaſe ſhall ſeem to require. The Ulcers being thus cleanſed, we muſt haſten to dry them, ſo that we may at length cicatrize them. This may be done by drying up the ſuperfluous moiſture, and ſtrengthening the parts that are moiſtned and relaxed by the continual defluxion, for which purpoſe this following decoction is very profitable. ℞ *Aq. ſabrorum,* ℔ j. *pſidiarum, balauſt. nucum cupreſ. conquaſſatorum, an.* ʒ j. *ſemin. ſumach. & berber. an.* ʒ ij. *ſyrup. roſar. & de abſinth. an.* ʒ j. *fiat decoctio.* You may keep it for an injection to be 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.

How to make water without pain.

Detergent injections.

How the cleanſed ulcers may be dried.

CHAP. XXII.

Of Caruncles or fleshy Excrescences which sometimes happen to grow in the Urethra, *by the heat or scalding of the Urin.*

How caruncles come to grow upon the ulcers of the genital parts.

A Sharp humour which flows from the Glandules termed *Prostatæ*, and continually runs alongst the urinary passage, in some places by the way it frets, and exulcerates by the acrimony the *Urethra* in men, but the neck of the womb in women. In these, as also is usual in other ulcers, there sometimes grows up a superfluous flesh, which oft-times hinders the casting or coming forth of the Seed and Urin by their appropriate and common passage, whence many mischiefs arise; whence it is that such ulcers as have caruncles growing upon them must be diligently cured. But first we must know whether they be new or old. For the later are more difficultly to be cured than the former, because the caruncles that grow upon them become callous and hard, being oft-times cicatrized. We know that there are caruncles, if the *Catheter* cannot freely pass alongst the passage of the Urin, but finds so many stops in the way, as it meets with caruncles that stop the passage; if the Patient can hardly make water, or if his water run in a very small stream, or two streams, or crookedly, or onely by drop and drop, with such tormenting pain, that he is ready to let go his excrements, yea and oft-times doth so, after the same manner as such as are troubled with the stone in the bladder. After making water, as also after copulation, some portion of the urin and seed stays at the rough places of the caruncles, so that the Patient is forced to press his Yard, to press forth such reliques. Sometimes the urin is wholly stopped, whence proceeds such distention of the bladder, that it causeth inflammation, and the urin flowing back into the body, hastens the death of the Patient. Yet sometimes the urin thus suppresst, sweats forth preternaturally in sundry places, as at the Fundament, *Perinæum*, Cod, Yard, Groins. As soon as we, by any 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 very little beginning, doth in a short time grow so big, that at the length it becomes incurable: verily, you may easily guess at the difficulty of the cure, by that we have formerly delivered of the essence hereof; besides, Medicins can very hardly arrive thereat. The fittest season for the undertaking hereof is the Spring, and the next thereto is Winter; yet if it be very troublesom, you must delay no time. Whilest the cure is in hand, the Patient ought wholly to abstain from Venery, for by the use thereof, the Kidnies, Spermatick Vessels, *Prostatæ*, and the whole Yard, swell up and wax hot, and consequently draw to them from the neighbouring and upper parts, whence abundance of excrements in the affected parts, much hinder the cure. You must beware of acrid and corroding things in the use of detergent injections, for that thus the *Urethra* being indued with most exquisit sense, may be easily offended, whence might ensue many ill accidents. Neither must we be frighted, if at sometimes we see bloud flow forth of secret or hidden caruncles. For this helps to shorten the cure, because the disease is hindered from growth, by taking away portion of the conjunct matter, the part also it self is eased from the oppressing burden, for the material cause of caruncles is superfluous blood. Wherefore unless such bleeding happen of it self, it is not amiss to procure it by thrusting in a *Catheter* somewhat hard, yet with good advice. If the caruncles be inveterate, and callous, then must they be mollified by Fomentations, Ointments, Cataplasms, Plasters, and Fumigations; you may thus make a Fomentation. ℞ *Rad. althæ. & lilior. alb. an.* ℥ v. *rad. bryoniæ, & sambuc. an.* ℥ j. ß. *fol. malvar. violarum parietar. & mercur. an.* m. ß. *sem. lini. fœnugr. an.* ℥ ß. *caricas pinq.* nu. xij. *florum chamæm. & melil. an.* p. j. *contundantur contundenda, incidenda incidantur, bulliant omnia in aqua communi:* make a Fomentation, and apply it with soft Sponges. Of the mass of the strained-out things you may make a cataplasm after this manner. ℞ *Prædicta materialia, terantur, & trajiciantur, adde axungiæ porci, unguenti basiliconis, an.* ℥ ij. *fiat cataplasma:* let it be applied presently after the fomentation. You may use this following Liniment whilest the Cataplasm is providing. ℞ *Unguenti althæ. & agrippæ, an.* ℥ j. ß. *æsypi humidæ, & axung. humanæ an.* ℥ j. *butyri recentis, olei lilior. & chamæm. an.* ʒ vj. *liquefiant simul, addendo aquæ vitæ* ℥ j. *fiat linimentum.* Let it be applied outwardly upon the part wherein the caruncles are. For the same purpose Plasters shall be applied, which may be diversified and fitted as you shall think good; yet *Emplastrum de Vigo* truly made, exceedeth all the rest in a mollifying faculty, and in wasting such callous hardness. The following Fumigation is also good for the same purpose; take some pieces of a Mill-stone (for this we use in stead of the *Pyrites* mentioned by the Ancients) or else some Bricks of large size, after they are heated hot in the fire, let them be put into a Pan and set under a Close-stool, then cause the Patient to sit thereon as if he were going to Stool, then pour upon the hot stones equal parts of very sharp Vinegar, and very good *aquæ vitæ*, and casting cloths about him, that nothing may exhale in vain: let him receive the ascending vapour at his Fundament, *Perinæum*, *Scrotum*, and *Urethra*. Moreover that this Medicin may work the better effect, you may put the Patient naked into the Barrel noted with this letter *A*, so that he 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 receive the fume that exhales therefrom, and none thereof be lost, he covering and vailing himself on every side. Such a fumigation in *Galen*'s opinion, hath a faculty to penetrate, cut, resolve, soften and digest scirrhous hardnesses.

Callous caruncles hard to cure. Signs.

The suppresst urin comes forth whereas it can get vent

The fittest time for the cure.

Why Venery must be eschewed.

The particular cure.

A Fomentation.

A Cataplasm.

A Liniment.

Vigo's Emplaster effectual to soften a caruncle.

A Suffumigium.

A Galen. lib. 2. cap. 5.

A Barrel fitted to receive the Fume in.

CHAP. XXIII.

What other remedies shall be used to Caruncles occasioned by the Lues Venerea.

Particular defaults of the *Lues Venerea* not to be cured unless by the general remedy of the virulency.

BUt if you suspect that these Caruncles come or are occasioned by a virulent humour, or the malignity of the *Lues Venerea*, it is meet that the Patient observe such a diet as usually is prescribed to such as are troubled with the *Lues Venerea*; let him use a decoction of *Guaiacum*, and let the *perinæum* and the whole Yard be anointed with ointment made for the *Lues Venerea*; otherwise the Surgeon will lose his labour. In the *interim*, whilest he shall sweat in his bed, he shall be willed to hold between his legs a stone-bottle filled with hot water, or else a hot brick wrapped in linnen cloths moistned in Vinegar and *Aqua vitæ*; for thus the heat and vapour will ascend to the genitals, which, together with the help of the applied ointment, will dissolve the matter of the Caruncles, and being thus softned, they must be consumed with convenient Medicins. Wherefore first, if they become callous, or cicatrized (which you may suspect if they cast forth no excrementitious humidity) they shall be exasperated, excoriated and torn with a leaden *Catheter* having a rough button at the end like a round file. He shall so long use the *Catheter* put into the *Urethra*, thrusting it up and down the same way so long and often as he shall think fit for the breaking and tearing the Caruncles, he 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 oft thrusting it in and out it may wear and make plain the resisting Caruncles. Verily by this means I have helped many much perplexed with the fearful danger of this disease. Some better like of the *Catheter* marked with this letter *A*, being 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.

Caruncles, if callous, must first be softned.

A Powder to waste Caruncles.

The Caruncle thus torn shall be strewed over with the following powder, being very effectual to waste and consume all Caruncles of the Privities without much pain. ℞ *Herb. sabin. in umbra exsiccat.* ʒ ij. *ocræ, antimon. tut. præparat. an.* ʒ ß. *fiat pulv. subtilissimus*; let it be applied in the following manner. Put the powder into the Pipe or *Catheter* having holes in the sides thereof, the which is the lowermost of the last described: then put the *Catheter* into the urinary passage until the slit or openness of the side come 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 come to the slit against the Caruncle, then will it adhere to the Caruncle bloudy, by reason of the said attrition. Then shall you draw forth the *Catheter*, first twining it about, that so it may not scrape off the powder again. If intolerable pain hereupon happen, it shall be aswaged, and the inflammation restrained by the following injection. ℞. *Succorum portulacæ, plantag. solani, & sempervivi, an.* ʒ ß. *albumin ovorum,* nu.vj. *agitentur diu in mortario plumbeo*; let it be 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 be unprofitable to apply repercussives to the genitals to hinder pain and inflammation. You may also use other Medicins, having a faculty to consume the Caruncle, amongst which these following are excellent. ℞ *Viridis æris, auripigmenti, vitriol. Rom. aluminis roch. an.* ʒ ij. *infundantur omnia in aceto acerrimo, atque inter duo marmora in pulverem redigantur:* then let it be exposed to Summers Sun, and dried, again infused in sharp Vinegar, and then as before ground upon a Marble, so that you find nothing sharp with your fingers; lastly, let it be opposed to the Sun until it may be made into most subtil Powder, and all the acrimony be vanished, which will be commonly in eight days space. Then, ℞ *ol. rosar.* ʒ iv. *litharg yr.* ʒ ij. *coquantur ad*

How to apply it.

An injection to hinder inflammation.

An Emplaster used by the Surgeons of *Montpelier* for Caruncles.

ignem

which will be commonly in eight days ſpace. Then ℞ *Ol. roſat.* ʒ iv. *lithargyr.* ʒ ij. *coquantur ad ignem, quouſque coierint in emplaſt. ſolidæ conſiſtentiæ, ab igne tum ſemovis, adde pulv. prædict.* ʒ ij. let them be mixed with a Spatula, and put it upon the fire until it come to ſo hard a conſiſtence, that it will ſtick faſt to a Wax Candle, or Lead Wier, ſo that it may not come off by handling with your hands. The Surgeons of *Montpelier* uſe this Medicin. This following is another; ℞ *Tutiæ præparat.* ʒ vj. *antimonii* ʒ iij. *trochiſc. alborum, Rhaſ. camphorat.* ʒ j. *corticis granati, aluminis uſti, an* ʒ j. ſ. *ſpongiæ uſtæ,* ʒ ij. let them be all made into powder: then, ℞ *Ung. diapompholygos, & alb. Rhaſis, an.* ʒ ij. *miſceantur cum prædictis pulveribus in mortario plumbeo, & diu agitentur:* let a very fine rag be ſpread over with this ointment, and wrapped about a Wax Candle, and ſo thruſt into the *Urethra*, and then draw forth the Candle by twining it a contrary way; ſo let the end of the rag hang out of the Yard ſo to pluck it forth again, when as you ſhall think it hath done what it can to the Caruncle, which is, when it hath covered it with the Medicin with which it was ſpread. Some alſo make Wax Candles with a ſlender, but ſtiff wick, whoſe end, which is to be put to wear and conſume the Caruncle, is compoſed of the following Medicin. ℞ *Emplaſtri nigri, vel diachylonis ireati,* ʒ ij. *pulv. ſabinæ, ceræ, vitriol. Rom. calcin. pul. mer. an.* ʒ ſ. *omnia liquefiant ſimul ad dictum uſum.* Whileſt the cure ſhall be in hand, by theſe following Medicins, let the Patient be careful that he ſo ſhake his Yard after making water, that he may ſhake forth all the reliques of the Urin which may chance to ſtop at the Caruncles, for if but one drop ſhould ſtay there, it would be ſufficient to ſpoil the whole operation of the applied Medicins. After that the Caruncle ſhall be worn away and wholly conſumed by the deſcribed Medicins, which you may know by the Urin flowing forth freely, and in a full ſtream, and by thrutting up a *Catheter* into the bladder without any ſtoppage; then it remains that the ulcers be dried and cicatrized, for which purpoſe the following injection is very powerful and effectual, and without any acrimony. ℞ *Aq. ſabrorum,* ℔ ſ. *nuc. cupreſ. gallar, cort. granat. an.* ʒ j. ſ. *alum. roch.* ʒ ſ. *bulliant. omnia ſimul ſecund. art.* ſo make a decoction for an injection, which you ſhall uſe ſo long until no excrementitious humidity diſtil out of the Yard. The following Powder dries more powerfully, and conſequently haſtens forwards cicatrization, and it is alſo without acrimony. ℞ *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 ſome *unguentum deſiccativum rubrum*, or ſome ſuch like thing. Alſo ſtrings or rods of lead thruſt into the *Urethra* as thick as the paſſage will ſuffer, even to the Ulcers, being firſt beſmeared with quick-ſilver, and kept in day and night as long as the Patient can endure, are good to be uſed. For they dry by their touch and cicatrize, they dilate the urinary paſſage without pain, and laſtly hinder the ſides of the Ulcers from corrupting one another.

Another Emplaſter.

How to apply it.

A caution in making water.

Signs that the Caruncle is worn away.

An Epuloick injection.

Quick-ſilver by drying cauſeth cicatrization.

Catheters fit to wear aſunder, or tear Carunckes.

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.*

CHAP. XXIV.

Of venereal Buboes, *or ſwellings in the Groins.*

THe virulency of the *Lues Venerea* is ſometimes communicated to the Liver, which if it have a powerful expulſive faculty, it expels 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 humours, as you may gather by the hardneſs and whiteneſs of the tumor, the gravity of the pain, and contumacy of curing; which alſo is another reaſon, beſides theſe that we formerly mentioned, why the virulency of this diſeaſe may be thought commonly to faſten it ſelf in a phlegmatick humour. Yet ſometimes venereal Buboes proceed from a hot, acrid, and cholerick humour, aſſociated with great pain and heat, and which thereupon often degenerate into virulent and corroding ulcers. Some venereous Buboes are ſuch conjoined accidents of the *Lues Venerea*, that they foretell it; ſuch are theſe which for a ſmall while ſhew a manifeſt tumor, and ſuddenly, without any manifeſt occaſion hide themſelves 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 be healed, the *Lues Venerea* yet remaining uncured. Such are theſe which are uſually ſeen, and which therefore compared with the former, may be termed ſimple and not implicit. For the cure, you muſt not uſe diſcuſſing Medicins, leſt reſolving the more ſubtil part, the groſſer dregs become impact and concrete there; but much

The efficient and material cauſes of venereous Buboes.

What Buboes fore-tell the *Lues Venerea.*

lefs muft we ufe repercuffives, for that the matter is virulent. Wherefore onely attractive and fuppurating Medicins are here to be ufed, agreeable to the humour predominant and cauſing the tumor, as more hot things in œdematous and ſcirrhous tumors, than in thoſe which reſemble the nature of a *phlegmon*, or *eryſipelas*: the indication taken from the rarity and denſity of bodies inſinuates the ſame variety. The applying of Cupping-glaſſes is very effectual to draw it forth: But when as it is drawn forth, you ſhall forthwith apply an emplaſtick Medicin, and then you ſhall come to ſuppuratives. When the tumor is ripe it ſhall be opened with a potential cautery, if it proceed from a cold cauſe; for by the inducing of heat the reſidue of the crude matter is more eaſily concocted; beſides, when as an ulcer of this kind is opened, the matter will be more eaſily evacuated, neither ſhall it be fit to uſe any tent, but only to apply pledgets. The reſidue of the cure ſhall be performed by detergent Medicins, and then, if need require, the Patient ſhall be let bloud, and the humours evacuated by a purging Medicin, but not before the perfect maturity thereof.

Cupping.

A potential Cautery.

CHAP. XXV.

Of the Exoſtoſis, *bunches or knots growing upon the bones by reaſon of the* Lues Venerea.

The matter of knots and virulent *Tophi*.

HArd tumors, *Exoſtoſes* and knots, have their matter from thick and tough phlegm, which cannot be diſſolved unleſs by hot Medicins, which have a mollifying and diſſolving faculty. For which purpoſe, beſides thoſe Medicins which uſually are applied to ſcirrhous humours, you muſt alſo make uſe of *Argentum vivum* commonly after this manner. ℞ *Emplaſt. filii Zach. & Cerouei, an.* ℥ iij. *euphorb.* ℥ ſ. *emplaſt. de Vigo,* ℥ ij. *cerat. æſyp. deſcript. Philagr.* ℥ j. *argent. vivi extinct.* ℥ vj. *fiat emplaſtrum.* Spread it upon Leather for your uſe. In the mean ſpace let the Patient obſerve a ſparing diet; for thus he ſhall be helped, if ſo be that the ſubſtance of the bones be yet unperiſhed: For if it be putrefied and rotten, then deſcribed Medicins are of no uſe, but you muſt of neceſſity lay bare the bone, either by inciſion, or elſe by an actual or potential cautery; but I had rather do it with an actual, for that it extracts the virulency impact in the bones, as alſo it haſtens the abſceſs, or falling away of the corrupted bone. It ſhall be 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 lies over it with an inciſion-knife, that ſo the pain may be the leſs, becauſe the fleſh cannot burn through but in a long time, by which the fire may come to the bone. But it will not be amiſs before we treat of this Art, firſt to conſider the nature of the rottenneſs of the bones.

An emplaſter againſt the bonching out of the bones.

CHAP. XXVI.

Why the bones become rotten, and by what ſigns it may be perceived.

Gal. meth. 6.

THat ſolution of continuity which is in the bones, is called by *Galen*, *Catagma*. This uſually is the cauſe of rottenneſs; for bones that are grated, bruiſed, rent, perforated, broken, luxated, inflamed and deſpoiled of the fleſh and skin, are eaſily corrupted; for deſpoiled of their covering, they are altered by the appulſe of the air, which they formerly never felt; whence alſo their bloud and proper nouriſhment is dried up and exhauſted. Beſides alſo, the *ſanies* running down by reaſon of wounds and old ulcers, in proceſs of time faſtens it ſelf into their ſubſtance, and putrefies by little and little: this putrefaction is increaſed and cauſed by the too much uſe of oily and fatty Medicins, as moiſt and ſuppurate things; for hence the Ulcer becometh more filthy and malign, the fleſh of the neighbouring parts groweth hot, is turned into *pus*, which preſently falling upon the bone lying under it, inflames 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 oft-times proceeds from the bones, but they heat not, becauſe according to the opinion of the Ancients, pulſation is a dolorifick motion of the Arteries, but the bones want ſenſe. Which verily I cannot deny, but alſo we muſt confeſs that the membrane that encompaſſeth them, and the arteries that enter into their body, are endued with moſt exquiſite ſenſe. Wherefore the arteries compreſſed and waxing hot by reaſon of the inflamed bone, cauſe a ſenſe of pain in the *periofteum*, 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 oft-times manifeſt to the eye, as when the bone is laid bare, for then it varieth from the natural colour, and becomes livid, yellowiſh, or black. Otherwiſe you may perceive it by touch, as by ſearching it with a probe, as when you meet with any inequality or roughneſs, or when but gently touching it your Probe runs into the ſubſtance of the bone as into rotten wood; for a bone is naturally hard, but being rotten, becomes ſoft. Yet hardneſs is not an infallible ſign of a ſound bone: for I have ſeen rotten and bared bones to have ſometimes grown ſo hard, by the appulſe of the air, that a Trepan could not, without a ſtrong endeavour, enter them. Alſo the rottenneſs of the bone is known by the condition of the filth which flows forth of the ulcer, for it is not onely more thin and liquid, but alſo more ſtinking. Furthermore, ſuch ulcers have a ſoft, looſe, and watery fleſh; beſides alſo they are untoward and rebellious to ſarcotick and epulotick Medicins; to which if they chance to yield and be 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 he know, whether the corruption be ſuperficiary, or pierce deep into the ſubſtance of the bone, that he may know how much of the bone muſt be ſcaled: for ſcaling is the onely cure of that which is corrupted; now it is ſcaled by that which dries exceedingly, and draws forth all the humidity, as well the excre-

The frequent cauſe of the rottenneſs of bones.

Hip. lib. de ulc. ſruit. Gal. lib. de tum. cont. nat.

Signs of the rottenneſs.

Hardneſs is no infallible ſign of ſound bones

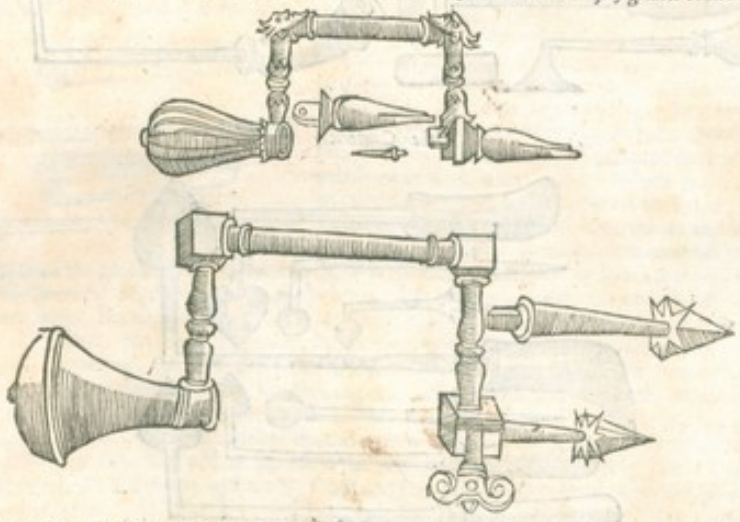
The cure of a rotten bone.

excrementitious, the author of the rottenneſs, as the alimentary: For thus it remains without bloud and nourithment, and conſequently life alſo; whence it muſt of neceſſity ſcale or fall off, being deſtitute of the glue or moiſture which joined it to the ſound parts in vicinity and communion of life, like as leaves which fall away from the trees, the humidity being 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 ſuperficiary. ℞ *Pul. aloes, cretæ combuſtæ, pompholygos, an.* ʒ ij. *ireos flor. ariſtoloch. rot. myrrh. ceruſſæ, an.* ʒ j. *pul. oſteor. combuſt.* ʒ ß. *terantur ſubtiliſſ. fiat pulvis*; let it be applied either alone by it ſelf, or elſe with Honey and a little *Aqua vitæ*. Alſo the following Emplaſter being applied, ſtirs up Nature to the excluſion of the broken bones, and cleanſeth the ulcers from the more groſs and viſcid *ſanies*. ℞ *Cer. nov. ref. pini, gum. ammon. & elemi, an.* ʒ vj. *tereb.* ʒ iij. *pul. maſtich. myrrh. an.* ʒ ß. *ariſtol. rot. ireos flor. aloes, opopan. euphorb. an.* ʒ j. *olei roſati quantum ſufficit, fiat emplaſt. ſecundum artem. Euphorbium*, according to *Dioſcorides*, takes off the ſcales of bones in one day. Hereto alſo conduceth *Emp. de betonica*. Or, ℞ *olei caryophyl.* ʒ ß. *camph.* ʒ ij. *miſceantur ſimul in mortario, & utere*. But if that part of the bone which is corrupt cannot thus be taken away, then muſt you uſe the ſcaling Trepans and Scrapers deſcribed formerly in wounds of the head; eſpecially if any more great or ſolid bone be foul. Furthermore the here-deſcribed Trepan will be good to perforate the rotten bone in many places where it is corrupted, until as it were a certain bloudy moiſture iſſue forth at the holes; for thus it more freely enjoys the air, and alſo the force of the medicins admitted by theſe holes work more powerfully.

A catagmatick Powder.

A deſquamatory or ſcaling Plaſter. *Dioſc. lib. 5. cap. 78.*

A Trepan with two triangular bits and a pin to hold them in the ſtock: as alſo another Trepan having four-ſquare and ſix-ſquare bits convenient to be uſed in the rottenneſs of greater bones.



But if the rottenneſs be 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 be cut off by the inſtruments deſcribed in wounds of the head, driving them into the bone with leaden mallets, leſt the part ſhould be too much offended or ſhaken with the blow. The ſcales and fragments ſhall be taken forth with mullets; the ſigns that all the rottenneſs is taken away, are the ſolidneſs of the bone thereunder, and the bloudy moiſture ſweating out thereat.

Signs that the rottenneſs is taken away.

CHAP. XXVII.

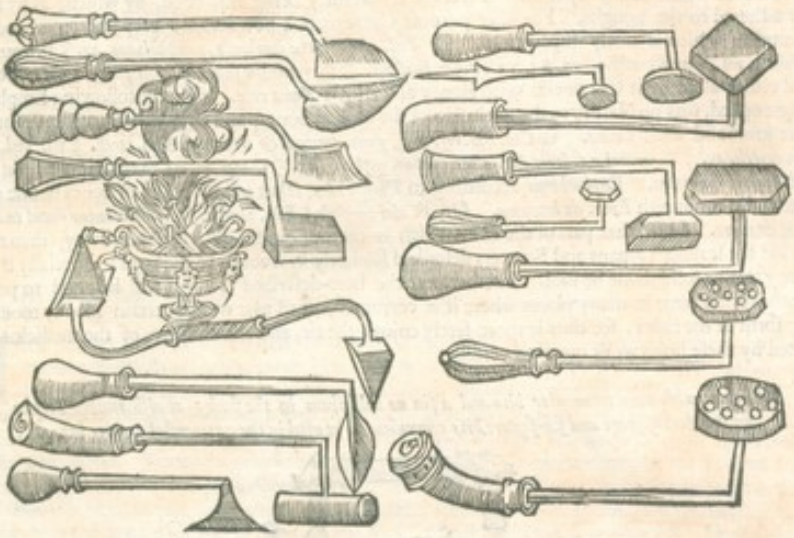
Of actual and potential Cauteries.

But if the deſcribed remedies cannot take place, by reaſon of the malignity or magnitude of the rottenneſs, then muſt we come to actual and potential Cauteries. But I ſhould rather approve of actual, becauſe by ſtrengthening the part they conſume the excrementitious humours wherewith it is overcharged, to wit, the matter of the *Caries*; which is not ſo effectually performed by potential cauteries. Yet are we oft-times forced to uſe theſe, to pleaſe the Patients which are terrified at, and afraid 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 be prudent and induſtrious, leſt he ſhould raſhly violate the neighbouring ſound parts by the burning touch of theſe things; which his temerity would cauſe vehement pains, inflammations, and other horrid ſymptoms. For actual Cauteries, their variety in figure is ſo great, that it cannot be defined, much leſs ſet down in writing; for they muſt be varied according to the largeneſs of the rottenneſs, and the figure and conformation of the fouled bones. Such as are more uſual I have thought good to delineate unto you, content onely to admoniſh you thus much, that ſome of theſe work by pricking, ſome by cutting, ſome flatwiſe, and other ſome with their points made to the form of an Olive-leaf.

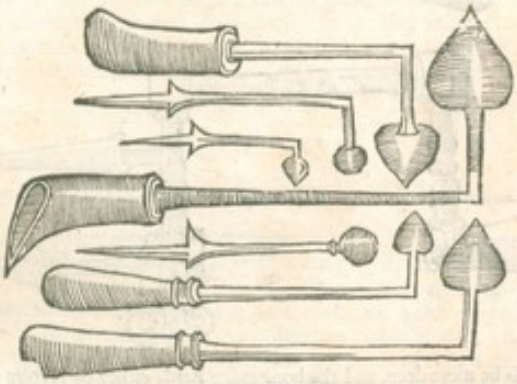
Actual Cauteries to be preferred before Potential.

Potential Cauteries.

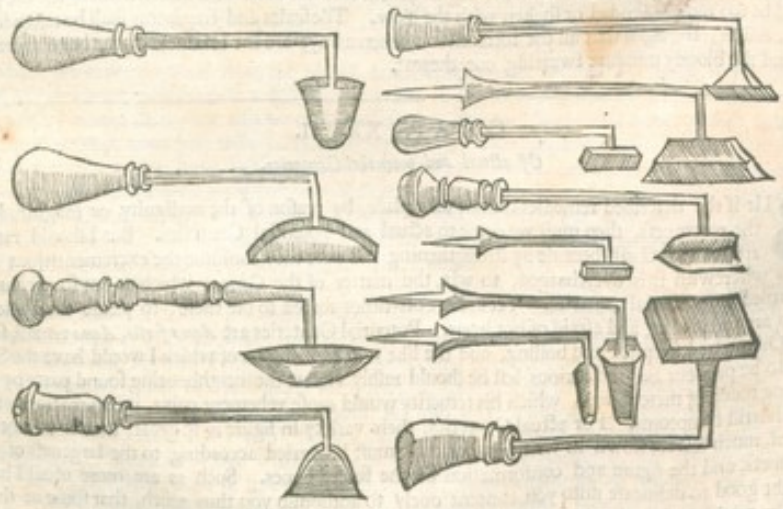
Sundry forms of actual Cauteries fit in all neceſſary caſes of all parts.



Other Cauteries.



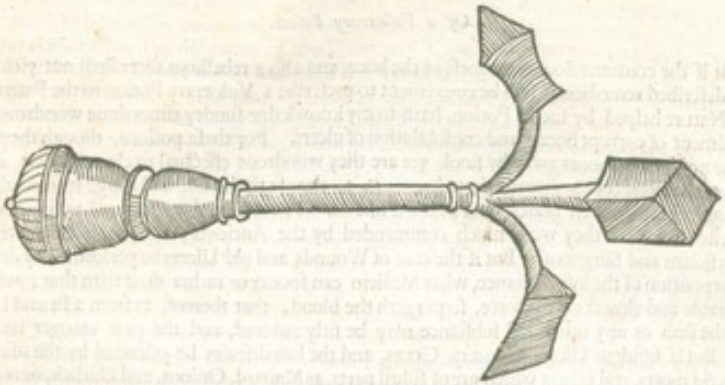
Other Cauteries for the ſame purpoſe.



The following figure of a Cautery is fit for virulent knots that ariſe in the ſcull, when you deſire to take away the fleſh that covers the bones 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 pleaſe.

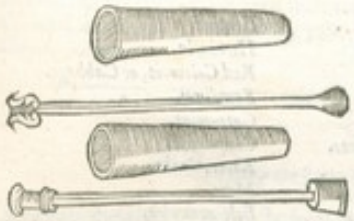
The

The Figure of an hollow and cutting Cautery.



The Cauteries whose forms are hereafter expreſt, take place in rotten bones that lie deep in, wherein you cannot make uſe of the formerly deſcribed, without touching of the neighbouring ſound parts. To avoid which danger, you ſhall put your cautery even to the bone through an iron pipe, which may keep the neighbouring and fleſhy 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 fiery heat not onely the excrementitious humidity 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, ſtands and conſiſts. Wherefore, the meaſure of applying of cauteries ought to be taken from the greatneſs of the rottenneſs, and the excrementitious, or after a manner, forming humidity ſweating through the pores of the bone. But before you preſs your cautery into the rotten bone which lies very deep in, as that which happens in the thigh-bone, and upon other very fleſhy parts, you muſt diligently defend the neighbouring ſound and fleſhy part, as it were with a covering, for that the humour diffuſed by the touch of the fire, burns 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 ſometimes dropping in our Oil of Whelps, being made ſcalding hot. This Oil, though very fit for this purpoſe, yet do I not judge it fit to uſe it too often, it may ſuffice to have dropped it in ſome twice or thrice; for at length it may violate the ſound bone that lies under the rotten, by the oily, ſubtil and moiſt ſubſtance. Furthermore, a bone is the moſt dry part of the body, therefore unctuous and moiſt Medicins are contrary to its temper and conſiſtence. But it conduceth often and gently to move the ſcales already beginning to ſeparate themſelves, and it haſtens the ſlackneſs of Nature in caſting them off. Yet may you not uſe force, unleſs peradventure when as they hang by a ſlender thread; otherwiſe if the unwary Surgeon forcibly pluck away the ſcales before that Nature hath put a cover upon the ſound bone, he ſhall give way to a new alteration and foulneſs, by the appulſe of the air. Furthermore, after the corrupt ſcale is falling off, by the force of Nature expelling it, you muſt have a diligent heed that you put not eating or corroding Medicins 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 bloud, is like in ſoftneſs to newly curdled milk, which otherwiſe in time would grow into a more ſolid and hard conſiſtence. This under-growing fleſh by little and little thruſts the rotten bone above it, out of its place, and is the cauſe of the ſcaling thereof; it is at the firſt gathered together like the grains of a pomgranate, with a red, ſmooth and equal *ſanies*, and not ſtinking, and at length it caſts forth a white matter. Therefore then we muſt rather ſtrew thereon Cephalick powder compoſed of ſuch things as have a faculty to dry without biting, ſuch as are Orris-root, waſhed Aloes, Maſtich, Myrrh, Barly-flower, and the like. Laſtly, it muſt be cicatrized, it is better that ſcales of bones fall away of themſelves, by the onely force of Nature, than to be plucked away by the force of Medicins or Inſtruments, becauſe ſuch as are too violently and forcibly plucked away, leave corners like to fiſtulous ulcers. Neither ought the corrupted membranes when they are turned into *pus*, to be plucked away too violently, or to be touched by too acrid Medicins; for pain hereupon ariſing, hath divers times cauſed inflammation, convulſion, and other pernicious ſymptoms. Therefore it is better to commit this buſineſs to Nature, which in ſucceſs of time, by making uſe of the expulſive faculty, 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.

Manner of applying of Cauteries.

Oil of Whelps helps forwards the caſting off of ſcales.

A caution in moving the ſcales of burnt bones.

Cephalick Powders of what compoſed.

CHAP. XXVIII.

Of a Vulnerary Potion.

The use of Vulnerary Potions.

But if the contumacious rottenness of the bone, and also a rebellious ulcer shall not yield to the described remedies, it will be convenient to prescribe a Vulnerary Potion to the Patient. For Nature helped by such a Potion, hath to my knowledge sundry times done wondrous things in amendment of corrupt bones, and consolidation of ulcers. For these potions, though they do not purge the noxious humours away by stool, yet are they wondrous effectual to cleanse ulcers, and free them from the excess of excrementitious humours, to cleanse the blood, and purge it from all impurity, 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 Ancients, but neglected by the modern Physicians and Surgeons. But if the cure of Wounds and old Ulcers be performed by detersion, and the reposition of the lost substance, what Medicin can sooner or rather do it than 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 any other lost substance may be fitly restored, and the part recover its former union? But if fistulous Ulcers, Cancers, Gouts, and the like diseases be offended by the use of salt, spiced, acrid meats, and others which are of subtil parts, as Mustard, Onions, and Garlick, or any other excess in meat or drink; why may they not become mild and gentle by medicated and contrary meats and drinks, or at least be reduced 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.

Scabious.	*Centaury.*	*Gentian.*
Sanicle.	*Adders-tongue.*	*Herniaria.*
Bugle.	*Betony.*	*Red Colewort, or Cabbage.*
Mouse-ear.	*Cardous benedictus.*	*Scordium.*
Burnet.	*The Cordial Flowers.*	*Cats-mint.*
Madder.	*Aristolochia, or Birth-worts.*	*Cinque-foil.*
Tansie.	*Speed-well.*	*River-Crabs.*
Tops of Hemp.	*Agrimony.*	*Mace.*
Tops of Brambles.	*The Capillaries.*	*Bole-armenick.*
Sow-bread.	*Herb-Robert.*	*Petum, or Tobacco.*
Comfrey the greater and lesser.	*Doves-foot.*	*Mead-sweet.*
Vervain.	*Dogs-tongue Avens.*	*Colts-foot.*
Bistort.	*Prunella.*	*Dandelion.*
Mug-wort.	*Osmund.*	*Plantain.*
Periwinckle.	*Clary.*	*St. Johns-wort.*

Of all these the Surgeon shall make choice according to the mind and judgment of the Physician, such as he shall think fit and proper to every Ulcer or Wound, or to each wounded and ulcerated part, according to the condition of the time, the temper of the Patient, and kind or nature of the disease. You may make drinks not only of the decoctions of these, but also of their juices in white Wine, or *anomel*, which are good not only to purifie the mass of the blood, to cleanse sanious, virulent, filthy, and dysenterious ulcers, but also to drive away putrefaction, scale-bones, dissolve 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. ℞ *Salvie. bugul. scabios. beton. scord. nepet. an.* m. ß. *uvar. mund. fom. hyper. & card. ben. an.* ℥ j. *trium flor. cord. an.* p. ij. *coquantur complete in aqu. communi; postea in fine adde vini alb. mel. ros. & cinnam. quod sufficit, fiat decoctio, coletur per manicam.* Let him drink ℥ iij. in the morning three 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 Patients broths, that so they may acquire a medicinable and nourishing faculty. For the time of the affect, wherein you may with good success make use of these, we have read in *Guido*, that he 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 be danger of a defluxion upon the affected part. Wherefore when the matter is come to suppuration, when as there is nothing remains, but to cleanse the ulcer, and fill it with flesh, no inflammation as now remaining in the part, I judge these potions may then be used with good success.

The form of a Vulnerary Potion.

In what time of the disease they are chiefly to be 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 makes furrows in the palms of the hands and soals of the feet. They acquire their matter from salt phlegm, or adust choler, or the reliques of the venereous virulency sent thither. The cure, especially when as the disease is grown old, is difficult; by reason that the humour hath long accustomed to flow that way, and for that it hath corrupted the habit of the part by the conti-

nual

nual defluxion; but the cure is more eaſie, if the diſeaſe be 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 denſineſs thereof. That which is old, beſides theſe fore-recited ſigns, hath ſcaly and bran-like hardneſſes conjoined therewith, which by ſcratching and rubbing caſteth off ſcales. For general Medicins, the diſtemper of the Liver, and habit of the Body muſt be corrected, which by the occaſion of the former diſeaſe and remedies, apt to inflame the bloud, cannot but much ſwerve from their native temper. This may be done by diet conveniently appointed, by purging and altering Medicins, bleeding, Bathing, applying of Cupping-glaſſes and horns. For topick, or particular Medicins, waſh ſuch as are newly or lately bred with the following water which dries, and is of ſubtil parts. ℞ *Aq. roſ. & pariet. an.* ʒ j. *aq. alum.* ʒ ij. *calc.* ʒ ij. *alum.* ʒ iij. *pul. ſubl.* ℈ iv. *fiat lenis, & minim. ebul. in baln. mar.* This water ſhall be made more or leſs forcible, according to the condition of the diſeaſe. Or, ℞ *Ol. tart.* ʒ ij. *ſcp. com.* ʒ iv. *miſc. fiat unguent. ad uſum.* If the Phyſician ſhall thing good, let the Patient uſe a decoction of *Guaiacum*, but that very weak. But old Tetters and Chops muſt be ſoftned with emollient, attenuating, and inciding decoctions, as alſo with Liniments, Ointments, and Plaſters having the ſame effect. Then let the reſidue of the cure be performed by Fumigations, ſuch as this which follows: ℞ *Pul. cinab.* ʒ ij. *lad. aſſ. odor. ſtyrac. cal. an.* ʒ ß. *olib. maſtic. an.* ʒ iij. *olei tart. & theriac. q. ſ. fiant trochiſci*; uſe at each time ſome ʒ ℈. of them, and let onely the affected parts receive the ſmoak. Some commend the rubbing of the hands with the following Medicin. Take the aſhes of Wine-lees, make thereof a lee, and ſtrain it through an hypocras-bag, then put thereto ſome rennet; let them be well mixed together in a mortar, and herewith let the hands be rubbed or waſhed. Or, ℞ *unguent. emul.* ʒ iij. *fugit.* ʒ ij. Or elſe, ℞ *Ref. pini.* ʒ j. *ceruſ. an.* ʒ ℈. *argent. viv.* ʒ iij. *ſuccl citri & lapath. acut. an.* ʒ ℈. Let them be incorporated, and make a Liniment to be 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 effectual. 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 diſeaſe.

The cure of newly come Tetters.

A Water drying virulent Tetters.

The cure of old Tetters.

A Fumigation.

A Liniment.

CHAP. XXX.

Of curing the Lues Venerea *in Infants, and little children.*

INfants oft-times conceive the ſeeds of this diſeaſe in the wombs of their mothers, and are born infected therewithall, puſtles preſently ariſing over all the bodies, infecting with the like diſeaſe as many Nurſes as give them ſuck; they ſcarce ever recover thereof, for that they contracted the diſeaſe from their firſt conformation. But ſuch as are ſomewhat bigger, if they chance to catch the diſeaſe after they are born, by ſucking ſome infected Nurſe, or by any other occaſion or kind of contagion, oftentimes receive cure. For firſt, you ſhall cauſe the Nurſe to uſe the *Aqua theriacalis* here-under deſcribed, for the ſpace of twenty or more days, that ſo ſhe may the better arm her ſelf againſt the contagion of this diſeaſe, and yield Milk which may have the faculty of meat and medicin; ſhe ſhall be careful, as often as ſhe gives the child ſuck, to waſh and dry her teat or pap, leſt the virulency that the child breaths out at his mouth, be impact in the little holes of the teat through which the milk flows out. Now the puſtles of little children ſhall be anointed with ſome ointment that receives *Argentum vivum* in ſome ſmall quantity, as *Unguentum exulatum cum mercurio*, or the like. Then ſhall it be ſwathed or bound up in ſwaths and cloths aired with the formerly deſcribed Fumigations. For the reſt, it ſhall be kept as warm as you can in ſome warm place. Theſe and the like muſt be done, not in one continued courſe, but at ſeveral ſeaſons, otherwiſe it is to be feared that it would cauſe ulcers to ariſe in the mouth, or elſe ſalivation. If any Ulcers ariſe in the mouth, and ſpread therein, they ſhall be touched with the formerly deſcribed waters, but made ſomewhat weaker, having regard to the tender age of the Patient; if the Infant ſhall get this diſeaſe of its Nurſe, let the Nurſe be preſently changed, for it being otherwiſe nouriſhed with tainted and virulent bloud, can never be healed. Many have by theſe means recovered; but ſuch as have periſhed, have not periſhed by the default of Medicins, but by the malignity and vehemency of the diſeaſe.

The Cure.

A deſcription of the Aqua Theriacalis, *or Treacle-water formerly mentioned.*

℞ *Raſor. interior. ligni ſancti gummoſi,* ℔ ij. *polypod. querni,* ʒ iv. *vini albi dulcedinis expertis* ℔ ij. *aqua fontan. purifſ.* ℔ viij. *aquar. cichor. & fumar. an.* ʒ iv. *ſem. junip. bedet. & baccar. lauri an.* ʒ ij. *cariophil. & macis, an.* ʒ ℈. *cort. citri ſaccaro condit. conſ. roſ. anthor, cichor. buglaſ. borag. an.* ʒ ℈. *conſ. enulæ camp. theriac. vet. & mithrid. an.* ʒ ij. diſtil them all in *Balneo Mariæ*, after the following manner. Let the *Guaiacum* be infuſed in equal parts of Wine, and the fore-mentioned waters for the ſpace of twelve hours, and the reſidue of the things in that which remains, of the ſame Wine and Waters for ſix hours ſpace, beating ſuch things as may require it, then let them be mixed together, that ſo the liquor may be endued with all their faculties. Which, that it may be the more effectually performed, let them be boiled, put up in glaſs bottles cloſely ſtopped for ſome three or four hours ſpace, in a large Kettle filled with boiling water; then let them be put into a Glaſs Alembick, and ſo diſtilled. Give ʒ iv. of this diſtilled liquor at once, being aromatized with ʒ j. of Cinamon, and ℥ j. of *Diamargariton*, and ʒ ß of Sugar, to give it a pleaſing taſte. Such a drink doth not onely retund the virulency of the *Lues Venerea*, but ſtrengthens the noble parts. *Rondeletius* makes an *Aqua Theriacalis* after this manner: ℞ *Theriac. vet.* ℔ j. *acetoſ.* m. iij. *rad. gram.* ʒ iij. *puleg. card. ben. an.* m. ij. *flor. chamæm.* p. ij. *temperentur omnia in vino albo, & diſtillentur in vaſe vitreo:* reſerve the water for uſe;

A Treacle-water.

The manner making it.

Rondeletius his Treacle-water.

where-

whereof let the Patient take ℥ ij. with ℥ iij. of Sorrel and Bugloſs water: he wiſheth this to be done when he ſhall enter into bed or a ſtove, for ſo this diſtilled liquor will cauſe ſweat more eaſily, and mitigate pain, whether given by it ſelf, or with a decoction of grommel, or of *China*, or Burdock-roots; yet if the Patient be of a phlegmatick conſtitution, he ſhall uſe a decoction of *Guaiacum* in ſtead of a decoction of *China*, for it penetrates more ſpeedily, by reaſon of its ſubtilty of parts, and alſo expels the dolorifick matter.

The End of the Nineteenth Book.

BOOK XX.

Of the SMALL POX and MEAZLES:

As alſo of WORMS, *and the* LEPROSIE.

CHAP. I.

Of the cauſes of the Small Pox and Meazles.

FOr that the Small Pox and Meazles are diſeaſes which uſually are fore-runners and fore-tellers of the Plague, not onely by the corruption of humours, but oft-times 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 be more amply and perfectly inſtructed in that peſtilent diſeaſe. Alſo I have thought good to treat of the Leproſie, as being the off-ſpring of the higheſt corruption of humours in the body. Now the ſmall Pox are puſtles, and the Meazles ſpots which ariſe in the top of the ſkin by reaſon of the impurity of the corrupt bloud ſent thither by the force of Nature. Moſt of the Ancients have delivered that this impurity is the reliques of the menſtruous bloud remaining in the body of the Infant, being of that matter from whence it drew nourihment in the womb, which lying ſtill or quiet for ſome ſpace of time, but ſtirred up at the firſt opportunity of a hotter Summer, or a ſoutherly or rainy ſeaſon, or a hidden malignity in the air, and boiling up, or working with the whole maſs of the bloud, ſpread or ſhew themſelves upon the whole ſurface of the body. An argument hereof is, there are few or none who have not been troubled with this diſeaſe, at leaſt once in their lives, which when it begins to ſhew it ſelf, not content to ſet upon ſome one, it commonly ſeizeth upon more: now commonly there is as much difference between the ſmall Pox and Meazles, as there is between a Carbuncle and a peſtilent Bubo: for the Small Pox ariſes of a more groſs and viſcous matter; to wit of a Phlegmatick humour: but the Meazles of a more ſubtil and hot; that is, a cholerick matter, therefore this yields no marks, but certain ſmall ſpots without any tumour, and theſe either red, purple, or black. But the Small Pox are extuberating puſtles, white in the midſt, but red in the circumference, an argument of bloud mixed with choler, yet they are ſcarce known at the beginning, that is, on the firſt or ſecond day they appear; but on the third and fourth day they bunch out and riſe up into a tumour, becoming white before they turn into a ſcab; but the Meazles remain ſtill the ſame. Furthermore, the ſmall Pox prick like needles by reaſon of a certain acrimony, and cauſe an itching; the Meazles do neither, either becauſe the matter is not ſo acrid and biting, or elſe for that it is more ſubtil, it eaſily exhales, neither is it kept ſhut up under the skin. The Patients often ſneeze when as theſe matters ſeek paſſage out, by reaſon of the putrid vapours 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 kind 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 eyes are fiery and ſwollen, their urin red and troubled. For Prognoſticks we may truly ſay thus much, That the matter whence this affect takes its original, partakes of ſo malign, peſtilent and contagious a quality, that not content to mangle and ſpoil the fleſhy part, it alſo eats and corrupts the bones like the *Lues Venerea*, as I obſerved not onely in *Anno Dom.* 1568. but alſo in divers other years, whereof I think it not amiſs to ſet down this notable example.

What the Small Pox and Meazles are. Their matter.

Why the Meazles do not itch.

An Hiſtory.

The daughter of *Claude Piqué* a Book-ſeller, dwelling in St. *James* his ſtreet in *Paris*, being ſome four or five years old, having been ſick of the Small Pox for the ſpace of a Moneth, and Nature could not overcome the malignity of the diſeaſe, 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 Kings chief Phyſician, *John Dorean* Surgeon to the *Conte de Bryane*, the body being diſſected in their preſence. Alſo you may obſerve in many killed by the malignity of this diſeaſe and diſſected, that it cauſeth ſuch impreſſion of corruption in the principal parts, as brings the Dropſie, Ptiſick, Hoarſneſs, Aſthma, Bloudy-flux ulcerating the Guts, and at length bringeth death, as the puſtles have raged or reigned over theſe or thoſe entrails, as you ſee them do over the ſurface of the body; for they do not onely moleſt the external parts, by leaving the impreſſions and ſcars of the puſtles and ulcers, rooting

What grievous and pernicious ſymptoms may happen by the Small Pox.

rooting themſelves deep in the fleſh, but alſo oft-times then take away the faculty of motion, eating aſunder, and weakning the joints of the Elbow, Writ, Knee, and Ankle. Moreover ſundry have been deprived of their ſight by them, as the Lord *Guymenay*, others have loſt their hearing, and otherſome the ſmelling, a fleſhy excreſcence growing in the paſſages of the noſe and ears. But if any relique of the diſeaſe remain, and that the whole matter thereof be expelled by the ſtrength of Nature, then ſymptoms afterwards ariſe, which ſavour of the malignity of the humour, yea and equal the harm of the ſymptoms of the *Lues Venerea*.

CHAP. II.

Of the Cure of the Small Pox and Meazles.

The Cure.

THe Cure of this Diſeaſe uſeth to be diverſe, according to the condition of the humour free from, or partaker of the venenate quality: For if it partake of malignity, and the child be a ſucking child, ſuch things ſhall be given to the Nurſe as may infringe and overcome the ſtrength of the malignity, as we ſhall ſhew more at large when we come to treat of the Cure of children which are ſick of the Plague; howſoever it be, the child muſt be kept in a warm room free from wind, and muſt be wrapped and covered with ſcarlet cloths, until the Pox come forth. There ſhall be provided for the Nurſe medicated Broths, with Purſlain, Lettuce, Sorrel Succory, Borage, and French-Barley bound up in a cloth. She ſhall ſhun all ſalt, ſpiced and baked Meats, and in ſtead of Wine, drink a decoction of Licorice, Raiſins, and Sorrel-roots. She ſhall alſo take purging Medicins, as if ſhe were ſick of the ſame diſeaſe, that ſo her milk may become medicinable. Laſtly, She ſhall obſerve the ſame diet as is uſually preſcribed to ſuch as have the Plague. You ſhall give the child no Pap, or if you give it any, let it be very little. But if the child be weaned, let him abſtain from fleſh until the Fever have left him, and the Pox be fully come forth: in ſtead of fleſh let him feed on Barley and Almond Creams, Chicken Broths, wherein the fore-named Herbs have been boiled, Panadoes, Gellies, Cullaſſes, Prunes, and Raiſins. Let his drink be a Ptiſan made of French-Barley, Graſs and Sorrel-roots or with a Nodula containing the four Cold Seeds, the pulp of Prunes and Raiſins, with the ſhavings of Ivory and Harts-horn; between meals the ſame decoction may be mixed with ſome Syrup of Violets, but not of Roſes or any other aſtringent Syrup, leſt we hinder the courſe and inclination of the humour outwards. Let his ſleep be moderate, for too found ſleep draws back the matter to the center, and increaſeth the Fever; you muſt neither purge, nor draw bloud, the diſeaſe increaſing or being at the height, unleſs peradventure there be a great plenitude, or elſe the diſeaſe complicate with other, as with a Pleuriſie, inflammation of the eyes, or a ſquinancy which require it, leſt the motion of Nature ſhould be diſturbed; but you ſhall think it ſufficient to looſe the belly with a gentle Clyſter: but when the height of the diſeaſe is over, and in the declenſion thereof, you may with *Caſſia* or ſome ſtronger Medicin evacuate part of the humours, and the reliques of the diſeaſe. But in the ſtate and increaſe, it is better to uſe Sudorificks, which by attenuating the humours and relaxing the pores of the skin may drive the cauſe of the diſeaſe from the center to the circumference, which otherwiſe reſiding in the body might be a cauſe of death; as I and *Richard Hubert* obſerved in two Maids, whereof one was four, and the other ſeventeen years old, for we diſſecting them both being dead, found their entrails covered with ſcabby or cruſted puſtles, like thoſe that break forth upon the skin. We muſt not think that a bleeding at noſe at the beginning of the diſeaſe, or in the firſt four or five days, ſhould carry away the matter and original of the diſeaſe, for nevertheleſs the Pox will come forth; but for that this is a true and natural *Criſis* of this diſeaſe, as that which is carried to the ſurface and circumference of the body, ſuch bleeding muſt not be ſtopped, unleſs you fear it will cauſe ſwounding. The matter ſhall be drawn forth with a decoction of Figs, huſked Lentils, Citron-ſeeds, the Seeds of Fennel, Parſly, Smallage, roots of Graſs, Raiſins, and Dates. For ſuch a decoction, certainly if it have power to cauſe Sweat, hath alſo a faculty to ſend forth unto the skin the morbifick humours; the Seeds of Fennel, and the like opening things relax and open the pores of the skin; Figs lenifie the acrimony of the matter, and gently cleanſe, 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 having their huſks on, they would bind more then is required in the diſeaſe; Dates are thought to comfort the ſtomach, and Citron Seeds to defend the heart from malignity; Licorice to ſmooth the throat, and hinder hoarſneſs and cauſe Sweat. But theſe things ſhall be given long after meat, for it is not fit to ſweat patiently after meat; ſome there be who would have the child wrapped in linnen cloths ſteeped in this decoction being hot, and afterwards hard wrung forth. Yet I had rather to uſe bladders or ſponges, or hot bricks for the ſame purpoſe; certainly a decoction of Millet, Figs and Raiſins, with ſome Sugar, cauſeth Sweat powerfully. Neither is it amiſs whileſt the Patient is covered in all other parts of the body, and ſweats, to fan his face, for thus the native heat is kept in, and ſo ſtrengthened, and fainting hindered, and a greater excretion of excrementitious humours cauſed. To which purpoſe you may alſo put now and then to the Patients noſe a *Nodulus* made with a little Vinegar and Water of Roſes, Camphire, the Powder of Sanders, and other odoriferous things which have a cooling faculty; this alſo will keep the noſe from puſtles.

The Child muſt have no Pap.

How ſound ſleep doth harm in this diſeaſe.

Of purging, bleeding, and ſudorificks.

An Hiſtory.

A ſudorifick decoction.*

When it is beſt to procure Sweat.

CHAP.

CHAP. III.

What parts muſt be armed againſt, and preſerved from the Pox.

How to defend the Eyes.

THe eyes, noſe, throat, lungs, and inward parts ought to be kept freer from the eruption of puſtles than the other parts, for that their nature and conſiſtence is more obnoxious to the malignity of this virulency, and they are eaſilier corrupted and blemiſhed. Therefore leſt the eyes ſhould be hurt, you muſt defend them when you firſt begin to ſuſpect the diſeaſe, with the eye-lids, alſo moiſtning them with Roſe-water, Verjuice or Vinegar, and a little Camphire. There are ſome alſo who for this purpoſe make a decoction of Sumach, Berbery-ſeeds, Pomgranat-pills. Aloes, and a little Saffron, the juice of ſower Pomgranats, and the water of the Whites of Eggs dropped in with Roſe-water are good for the ſame purpoſe, alſo Womens milk mixed with Roſe-water and often renewed, and laſtly all ſuch things as have a repercuſſive quality. Yet if the eyes be much ſwollen and red, you ſhall not uſe repercuſſives alone, but mix therewith diſcuſſers and cleanſers, ſuch as are fit by a familiarity of Nature to ſtrengthen the ſight; and let theſe be tempered with ſome Fennel or Eye-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 eyes are at their height, gently drying and diſcuſſive things properly conducing to the eyes, are moſt convenient, as waſhed Aloes, Tutty, and Antimony, in the Water of Fennel, Eye-bright, and Roſes.

When the Eyes muſt not be defended by repercuſſives onely.

How to defend the Noſe.

How the Mouth.

How the Lungs.

The formerly mentioned *Nodulus* will preſerve the noſe, and linnen cloths dipped in the fore-ſaid aſtringent decoction, put in the noſtrils, and outwardly applied. We ſhall defend the jaws, throat, and throtle, and preſerve the integrity of the voice by a gargle of oxycrate, or the juice of ſower Pomgranats, holding alſo the grains of them in their mouths, and often rouling them up and down therein, as alſo by Nodulaes of the ſeeds of *Pſilium*, Quinces, and the like cold and aſtringent things. We muſt provide for the lungs and reſpiration by ſyrups of Jujubes, Violets, Roſes, white Poppies, Pomgranats, Water-Lillies, and the like. Now when as the Pox are throughly come forth, then may you permit the Patient to uſe ſomewhat a freer diet, and you muſt wholly buſie your ſelf in ripening and evacuating the matter, drying and ſcaling them. But for the Meazles, they are cured by reſolution onely, and not by ſuppuration; the Pox may be ripened by anointing them with freſh butter, by fomenting them with a decoction of the Roots of Mallows, Lillies, Figs, Line-ſeeds, and the like.

How to prevent Pock-arrs

After they are ripe, they ſhall have their heads clipped off with a pair of Sciſſers, or elſe be opened with a golden or ſilver needle, leſt the matter contained in them ſhould corrode the fleſh that lies thereunder, and after the cure, leave the prints or pock-holes behind it, which would cauſe ſome deformity; the *pus* or matter being evacuated, they ſhall be dried up with *unguent. roſat.* adding thereto Ceruſs, Litharge, Aloes, and a little Saffron in Powder; for theſe have not onely a faculty to dry, but alſo to regenerate fleſh; for the ſame purpoſe the flower of Barley and Lupines are diſſolved and mixed with Roſe-water, and the affected parts anointed therewith with a fine linnen rag; ſome anoint them with the ſward of Bacon boiled in Water and Wine, then preſently ſtrew upon them the flower of Barly or Lupines, or both of them. Others mix crude Hony newly taken from the Comb, with Barly-flower, and therewithal anoint the puſtles ſo to dry them; being dried up like a ſcurf or ſcab, they anoint them with Oil of Roſes, Violets, Almonds, or elſe with ſome Cream, that they may the ſooner fall away, the puſtles being broken; tedious itching ſolicits the Patient to ſcratch, whence happens excoriation and filthy ulcers, for ſcratching is the occaſion of greater attraction. Wherefore you ſhall bind the ſick childs hands, and foment the itching parts with a decoction of Marſh-mallows, Barly and Lupines, with the addition of ſome ſalt. But if it be already excoriated, then ſhall you heal it with *unguentum album camphorat.* adding thereto a little Powder of Aloes or *Cinnabaris*, or a little *deſiccativum rubrum*. But if notwithſtanding all your application of repelling medicins, puſtles nevertheleſs break forth at the Eyes, then muſt they be diligently cured with all manner of *Collyria*, having a care that the inflammation of that part grow not to that bigneſs as to break the Eyes, and that which ſometimes happens to drive them forth of their proper orbs. If any cruſty ulcers ariſe in the noſtrils, they may be dried and cauſed to fall away by putting up of Ointments. Such as ariſe in the Mouth, Palate, and throat, with hoarſneſs and difficulty of ſwallowing, may be helped by Gargariſms made with Barly-water, the Waters of Plantain and Chervil, with ſome 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 be clipped away with a pair of Sciſſers, and then anointed with freſh *Unguent. citrin.* or elſe with this liniment. ℞ *Amyli tritici & amygdalar. excorticatarum an.* ʒ j ß. *gum. tragacanth.* ʒ ß. *ſeminis meloncum, fabarum ſiccarum excorticat. farinæ hordei, an.* ʒ iv. Let them all be made into fine Powder, and then incorporated with Roſe-water, and ſo make a Liniment, wherewith anoint the face with a feather; let it be wiped away in the morning, waſhing the face with ſome water and wheat-bran; hereto alſo conduceth *lac virginale*; Gooſe, Ducks, and Capons greaſe are good to ſmooth the roughneſs of the ſkin, as alſo of Oil of Lillies; Hares bloud of one newly killed and hot, is good to fill and plain, as alſo whiten the Pock-holes, if they be often rubbed therewith. In ſtead hereof many uſe the ſward of Bacon rubbed warm thereon; alſo the diſtilled Waters of Bean-flowers, Lilly-roots, Red-roots, Egg-ſhells, and Oil of Eggs are thought very prevalent to waſte and ſmooth the Pock-arrs.

Remedies for excoriation.

For the ulcers of the mouth and jaws.

To help the unſightly ſcars of the Face.

A

A Discourse of certain monstrous Creatures which breed against Nature in the bodies of Men, Women, and little Children, which may serve as an Induction to the ensuing Discourse of WORMS.

AS in the *Macrocosmus* or bigger World, so in the *Microcosmus* or lesser World there are Winds, Thunders, Earthquakes, Showrs, Inundations of Waters, Sterilities, Fertilities, Stones, Mountains, and sundry sorts of Fruits and Creatures thence arise. For who can deny but that there is Wind contained and shut up in flatulent abscesses, and in the guts of those that are troubled with the Colick? Flatulencies make so great a noise in divers womens bellies, if so be you stand near them, that you would think you heard a great number of Frogs croaking in the night time. That Water is contained in watery abscesses, and the belly 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 body is no otherwise shaken and trembles, than the Earth when it is heard to bellow, and felt to shake under our feet. He which shall see the Stones which are taken out of the bladder, and come from the kidnies and divers other parts of the body, cannot deny but that Stones are generated in our bodies. Furthermore we see both Men and Women, who in their Face or some other parts shew the impression or imprinted figure of a Cherry, Plumb, Service, Fig, Mulberry, and the like Fruit; the cause hereof is thought to be the power of the Imagination concurring with the formative faculty, and the tenderness of the yielding and wax-like *Embryon*, easie to be brought into any form or figure, by reason of the proper and native humidity. For you shall find that all their Mothers whilest they went with them have earnestly desired or longed for such things, which, whilest they have too earnestly agitated in their minds, they have transferred the shape unto the child, whilest that they could not enjoy the things themselves. Now who can deny but that the Bunches of the Back and large Wens resemble Mountains? Who can gain-say, but that the squalid Sterility may be assimilate to the hectick drinefs of wasted and consumed persons? and Fertility deciphered by the body distended with much flesh and fat, so that the legs can scarce stand under the burden of the belly? But that divers Creatures are generated in one Creature, that is in Man, and that in sundry parts of him, the following Histories shall make it evident.

A comparison between the bigger and lesser World. The anergation of wind in mans body. Of Water. Of Stones. Of fruits from the first conformation.

Hollerius tells that a certain *Italian* by frequent smelling to the Herb Basil, had a Scorpion bred in his Brain, which caused long and vehement pain, and at length death; therefore I have here expresst the figure of that Scorpion, found when as his Brain was opened. *Lib. de morb. intr. cap. 1.*

The Figure of a Scorpion.

It makes *Hollerius* conjecture of the cause and original of this Scorpion probable, for that *Chrysippus*, *Diophanes*, and *Pliny* write, that of Basil beaten between two stones, and laid in the Sun, there will come Scorpions.

Fernelius writes that in a certain Souldier who was flat nosed, upon the too long restraint or stoppage of a certain filthy matter that flowed out of the nose, that there were generated two hairy worms of the bignesse of ones finger, which at length made him mad; he had no manifest Fever, and he died about the twentieth day. This was their shape, by as much as we can gather by *Fernelius* his words. *Lib. 5. de part. morbic. cap. 7.*

The Effigies of Worms mentioned by Fernelius.

The shape of a Millepes cast forth by Urin.

Lues Duret, a man of great learning and credit, told me that he had come forth with his Urin, after a long and difficult disease, a quick Creature, of colour red, but otherwise in shape like a Millepes, that is, a Chesse, or Hog-louse. An History.

Count *Charles* of *Mansfields* last Summer troubled with a grievous and continual Fever, in the Duke of *Guises* place cast forth at his Yard, in the shape of a live thing almost just in this form. An History.

The

The ſhape of a thing caſt forth by Urin.

Nicolaus Flor. God. lib. 7 c. 18.

Monſtrous Creatures alſo of ſundry forms are alſo generated in the wombs of women; ſomewhiles alone, otherwhiles with a *Mola*, and ſometimes with a Child naturally and well made; as Frogs, Toads, Serpents, Lizzards: which therefore the Ancients have termed the Lombards 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 kind generated in their wombs, for that they always more reſpected the decking of their bodies than 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 very ſubject to putrefaction and corruption, and conſequently opportune to generate ſuch unperfect creatures. *Jonbertus* telleth that there were two *Italian* women that in one moneth 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* writes that in *Anno Dom.* 1494. a woman in *Cracovia*, in the ſtreet which taketh name from the Holy Ghoſt, was delivered of a dead child who had a Serpent faſtned upon his back, which fed upon this dead child, as you may perceive by this following Figure.

Lib. error. popul.

The Figure of a Serpent faſtned to a Child.

Lib. de occult. nat. mir. cap. 8.

Levinus Lemnius tells a very ſtrange Hiſtory to this purpoſe. Some few years agone (ſaith he) a certain woman of the Iſle in *Flanders*, which being with child by a Sailor, her belly ſwelled up ſo ſpeedily, that it ſeemed ſhe would not be able to carry her burden to the term preſcribed by Nature; her nineth moneth being ended, ſhe calls a Midwife, and preſently after ſtrong throws and pains, ſhe firſt brought forth a deformed lump of fleſh, having 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 Sponges and Sea-nettles; but afterwards there came forth of her womb a monſter with a crooked noſe, a long and round neck, terrible eyes, 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 Womans Womb.

As ſoon as it came into the light, it filled the wholer 20m with a noiſe and hiſſing, running to every ſide to find 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 Boy, but ſo evilly entreated and handled by this Monſter, that it died as ſoon as it was chriſtened.

Come-

Cornelius Gemma, a Physician of *Louain*, telleth that there were many very monstrous and strange things cast forth, both upwards and downwards out of the belly of a certain Maid of *Louain*, of the age of fifteen years. Amongst the rest, she cast forth at her fundament, together with her excrements, a living creature some foot and half long, thicker then ones thumb, very like an Eel, but that it had a very hairy tail. I have here given you the figure of the Monster, as it was expressed by him. *Lib. de divinâ, natur. Cleavelii tiſsue.*

The Figure of a Monster that came forth of a Maids Belly.

An History. Master *Peter Barque* and *Claude le Grand*, Surgeons of *Verdun*, lately affirmed to me, that they cured the wife of a certain Citizen of *Verdun*, which out of an Abscess broken in the belly, cast forth a great number of Worms, together with the quitture; 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 she is perfectly recovered.

An History. *Anthony Benevius* a Physician of *Florence*, telleth that one *John Menusierus*, a man of forty years of age, troubled with continual pains at his stomach, was often at the point of death, neither found he any help by the counsels of many Physicians which he used. At length coming to have his advice, he gave him a vomit, by means whereof he cast up a great quantity of corrupt and putrid matter, yet was he not thereby eased of his pain: Therefore he gave him another vomit, by force whereof he cast up much matter like to the former, and together therewith a Worm of four fingers long, having a red round head, of the bigness of a great Pease, covered over the body with a soft downiness, with a forked tail in manner of a half Moon, going upon four feet, two before, and two behind.

The Figure of a Worm cast forth by Vomit.

The efficient and material causes of such things as are preternaturally generated in our bodies. Why should I mention the prodigious bodies which are found in Abscesses, as Stones, Chalk, Sand, Coals, Snail-shells, Straws, Hay, Horns, Hairs, and many kinds of living and dead creatures? For there is nothing in the generation of these things (caused by corruption, preceded by much alteration) which may make us admire, or hold us in suspence, especially if we shall 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 *Microcosmus*, or little World, Man; whereby he might the rather seem to be made to the resemblance and form of the greater. Wherefore it so disports 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 be that matter be not wanting.

CHAP. IV.

Of the Worms which use to breed in the Guts.

How Worms are generated. A Gross visqid and crude humour is the material cause of Worms, which having got the beginning of corruption in the Stomach, is quickly carried into the Guts, and there it putrefies, having not acquired the form of laudable *Chylus* in the first concoction. This, for that it is viscid, tenaciously adheres to the Guts, neither is it easily evacuated with the other excrements; therefore by delay it further putrefies, and by the efficacy of heat, it turns into the matter and nourishment for Worms. This alimentary humour being consumed, unless some fresh supply the want thereof, which may ease their hunger, they move themselves in the Guts with great violence, they cause grievous and great pains, yea, and oft-times they creep up to the Stomach, and so come forth by the Mouth, and sometimes they ascend into the holes of the Palat, and come forth at the Nose. Worms are of three sorts, for some are round and long, others broad and long, others short and slender. The first are called by the Ancients *Teretes*, that is round, for that they are long and round. The second are named *Tenie*, for that their bodies are long and broad, like a Rowler or Swathe. The third are termed *Ascarides*, for that they commonly wrap themselves up round. Other differences of Worms are taken from their colours, as red, white, black, ash-colour, we a *Millers Thumb*; in some diseases many worms are generated and cast forth by the Fundament, as small as hairs, and usually of colour white, and these are they which are called *Ascarides*. The diversity of colours in Worms proceedeth not from the like distinct diversity of humours whereof they are generated. For the melancholick and cholerick humour by their qualities are wholly unfit to generate Worms. But this manifold variety in colour, is by reason of the different corruption of the *chylus* or phlegmatick humour whereof they are bred. The long and broad Worms are often-times stretched alongst all the Guts, being like to a mucous or albuminous substance; and

The reason that they some times come forth at the mouth.

The differences of Worms.

An History. verily I saw one voided by a Woman which was like to a Serpent, and some six foot long, which ought not to seem strange, seeing it is noted by the Ancients, that they have seen Worms so long
An History. as the length of the whole Guts, that is seven times the length of ones body. *Wierus* writes, that he saw a Country-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.

The Figure of a Worm, generated in, and cast forth of the Gut.

In observat. *Valeriola* affirmeth, that he 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 gene-
In what places of the belly worms are generated. rated in the smaller guts, the rest in the greater, but especially the *Ascarides:* none breed in the Stomach, as that which is the place of the first concoction. There truly the matter which breedeth these Worms, gets the first rudiment of corruption, but comes to perfection onely in the guts; they breed in some Infants in their mothers bellies, by the pravity and corrupt nature of the humour flowing from the Mother for the nourishment of the Child, which for that then they do not expel it by siege, it by delay putrefieth the more, and yields fit matter for the breeding of Worms, as some
Ad finem lib. 4. de morbu. have observed out of *Hippocrates*. Lastly, Worms breed in people of any age that are Belly-gods and given to gluttony, as also in such as feed upon meats of ill juice, and apt to corrupt, as crude Summer-fruits, Cheese, and Milk-meats. But to know in what part of the guts the Worms do lurk, you must
Signs of Worms in the small guts. 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 many and several things without reason, a great part of the nourishment being consumed by the Worms lying there; they are also subject to often fainting, by reason of the sympathy which the stomach, being a part of most exquisit sense, hath with the heart, the nose itches, the breath stinks, 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 therefrom by sudden startings and fears; they are held with a continued and slow fever, a dry cough, a winking with their eye-lids, and often changing of the colour of their faces. But long and broad Worms being the innates of the greater guts, shew themselves by stools replenished with many sloughs,
Signs of worms in the great guts. here and there resembling the seeds of a Musk-melon or Cucumer. *Ascarides* are known by the itching they cause in the Fundament, causing a sense as if it were Ants running up and down; causing also
Signs of *Ascarides.* a *tenasmus*, and falling down of the Fundament. This is the cause of all these symptoms; their sleep is turbulent and often clamorous, when as hot, acrid and subtil vapours, raised by the Worms from the like humour and their food, are sent up to the head; but sound sleep by the contrary, as when a misty vapour is sent up from a gross and cold matter. They dream they eat in their sleep, for that while the Worms do more greedily consume the chylous matter in the guts, they stir up the sense of the like action in the phantasie. They grate or gnash their teeth by reason of a certain convulsick repletion, the muscles of the temples and jaws being distended by plenty of vapours. A dry cough comes by the consent of the vital parts serving for respiration, which the natural, to wit, the *Diaphragma*, or Midriff, smit upon by acrid vapours, and irritated as though there were some humour to be expelled by coughing. These same acrid fumes assailing the orifice of the ventricle, cause either an hicketting, or else a fainting, according to the condition of their consistence, gross or thin; these carried up to the parts of the Face cause an itching of the Nose, a darkness of the Sight, and a sudden changing of the colour in the cheeks. Great Worms are worse than little ones, red than white, living than dead, many than few, variegated than those of one colour, as those which are signs of a greater corruption. Such as are cast forth bloudy and sprinkled with bloud, are deadly, for
Why worms of divers colours are more dangerous. they shew that the substance of the guts is eaten asunder; for oft-times they corrode and perforate the body of the gut wherein they are contained, and thence penetrate into divers parts of the belly; so that they have come forth sometimes at the navel, having eaten themselves a passage forth, as *Holerius* affirmeth. When as children troubled with the Worms draw their breath with difficulty, 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 come forth alive, it is sign of a pestilent Fever, the malignity of whose matter they could not endure, but were forced to come forth. But if they be cast forth dead, they are signs of greater corruption in the humours, and of a more venenate malignity.

CHAP.

CHAP. V.

What Cure to be used for the Worms.

IN this disease there is but one Indication, that is, the exclusion or casting out of the Worms either alive or dead forth of the body, as being such that in their whole kind are against Nature; all things must be shunned which are apt to heap up putrefaction in the body by their corruption, such as are crude Fruits, Cheese, 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 be the more easily 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 be too viscid nor thick, if it should onely be boiled in a Pan as much as the Milk would require; or else the Milk would be too terrestrial or too waterish, all the fatty portion thereof being resolved, the cheese and whayish portion remaining, if it should boil so much as were necessary for the full boiling of the crude meat; they which use meal otherwise in pap, yield matter for the generating of gross and viscid humours in the stomach, whence happens 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 be 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 be purged, and the putrefaction repress by Medicins mentioned in our Treatise of the Plague. For the quick killing and casting of them forth, Syrup of Succory or of Limmons with Rubarb, a little Treacle or Mithridate, is a singular Medicin, if there be no Fever. You may also for the same purpose use this following Medicin. ℞ *Cornu cervi, pul. rasur. eboris, an.* ʒ j. β. *sem. tanacet. & contra verm. an.* ʒ j. *fiat decoct. pro parva dosi, in colat. infunde rhei optimi,* ʒ j. *cinam.* ℈ j. *dissolve syrupi de absinth.* ℥ β. make a potion, give it in the morning three hours before any broth. Oil of Olives drunk, kills Worms; as also Water of Knotgrass drunk with Milk; and in like manner all bitter things. Yet I could first wish them to give a Clyster made of Milk, Honey, and Sugar, without Oils and bitter things, lest shunning thereof they leave the lower guts and come 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 always mix sweet things, that allured by the sweetness, they may devour them more greedily, that so they may kill them. Therefore I would with Milk and Sugar mix the seeds of Centaury, Rue, Womwood, Aloes, and the like: Harts-horn is very effectual against Worms, wherefore you may infuse the shavings thereof in the Water or Drink that the Patient drinks, as also to boil some 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 Succory and Mints; also a decoction of the lesser Housleek and Sebetens given with Sugar before meat; it is no less effectual to put Worm-seeds in their Pap, and in roasted Apples, and so to give them it. Also you may make suppositories after this manner, and put them up into the Fundament. ℞ *Coralli subalbi, rasuræ eboris, cornu cerv. usti, ireos, an.* ℈ ij. *mellis albi* ℥ ij. β. *aquæ centinodiæ q.s. ad omnia concorporanda, fiant Glandes:* let one be put up every day, of the weight of ʒ ij. for children; these suppositories are chiefly to be used for *Ascarides*, as those which adhere to the right gut. To such children as can take nothing by the mouth, you shall apply Cataplasms to their navels made of the Powder of Cummin-seeds, the flower of Lupines, Wormwood, Southernwood, Tansie, the leaves of Artichokes, Rue, the Powder of *Coloquintida*, Citron-seeds, Aloes, Arsesmart, Horse-mint, Peach-leaves, *Costus amarus, Zedoaria*, Sope, and Ox-gall. Such Cataplasms are oft-times spread over all the belly, mixing therewith astringent things for the strengthening of the part, as Oil of Myrtils, Quinces and Mastich; you may also apply a great Onion hollowed in the midst, and filled with Aloes and Treacle, and so roasted in the Embers, then beaten with bitter Almonds, and an Ox gall. Also you may make Emplasters of bitter things, as this which follows: ℞ *Fellis bubuli, succi absinth. an.* ℥ ij. *colocyn.* ʒ j. *terantur & misceantur simul, incorporentur cum farina lupinorum:* make hereof an Emplaster to be laid upon the navel.

Liniments and Ointments may be also made for the same purpose, to anoint the belly; you may also make Plasters for the navel of *Pilulæ Ruf.* anointing in the mean time the Fundament with Honey and Sugar, that they may be chased from above with bitter things, and allured downwards with sweet things. Or else take Worms that have been cast forth, dry them in an iron pan over the fire, then powder them, and give them with Wine or some other liquor to be 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 some make Baths against this affect, of Wormwood, Galls, Peach-leaves boiled in Water, and then bathe the child therein.

But in curing the Worms, you must observe that this disease is oft-times entangled with another more grievous disease, as an acute and burning Fever, a flux or scouring, and the like; in which (as for example sake) a Fever being present and conjoined therewith, if you shall give Worm-seeds, old Treacle, Myrrh, Aloes, you shall increase the Fever and Flux, for that bitter things are very contrary to these affects. But if on the contrary, in a Flux whereby the Worms are excluded, you shall give Corral, and the Flower of Lentils, you shall augment the Fever, making the matter more contumacious by dry and astringent things. Therefore the Physician shall be careful in considering whether the Fever be a symptom of the Worms, or on the contrary it be essential, and not symptomatick; that this being known, he may principally insist in the use of such Medicins as resist both affects, as Purging and bitterish in a Fever and Worms, but bitter and somewhat astrictive things in the Worms and Flux.

The general Indications of curing the Worms.

Wherefore, and wherewith such as have the Worms must be purged.

Harts-horn good against the Worms.

Suppository against the *Ascarides.*

A Plaster against the Worms.

A Fever sometimes a symptom, and sometimes a disease.

CHAP. VI.

A ſhort deſcription of the Elephantiaſis *or Leproſie, and of the Cauſes thereof.*

THis diſeaſe is termed *Elephantiaſis*, becauſe 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 be impoſed thereon, by reaſon of the greatneſs of the diſeaſe. Some from the opinion of the *Arabians*, have termed it *Lepra*, or Leproſie (but unproperly, for the *Lepra* is a kind of ſcab and diſeaſe of the skin, which is vulgarly called *Malum ſancti maurit*) which word for the preſent we will uſe, as that which prevails by cuſtom and antiquity. Now the Leproſie (according to *Paulus*) is a Cancer of the whole Body, the which (as *Avicen* adds) corrupts the complexion, form and figure of the members. *Galen* thinks the cauſe ariſeth from the error of the ſanguifying faculty, through whoſe default the aſſimilation in the fleſh and habit of the body is depraved, and much changed from it ſelf, and the rule of Nature. But *ad Glauconem*, he defines this diſeaſe, An effuſion of troubled or groſs bloud into the veins and habit of the whole body. This Diſeaſe is judged great, for that it partakes of a certain venenate virulency, depraving the members and comelineſs of the whole body. Now it appears that the Leproſie partakes of a certain venenate virulency by this, that ſuch as are melancholick in the whole habit of their bodies, are not leprous. Now this diſeaſe is compoſed of three differences of Diſeaſes: Firſt, it conſiſts of a diſtemper againſt Nature, as that which at the beginning is hot and dry, and at length the ebullition of the humours ceaſing, and the heat diſperſed, it becomes cold and dry, which is the conjunct cauſe of this ſymptom. Alſo it conſiſts of an evil compoſition or conformation, for that it depraves the figure and beauty of the parts. Alſo it conſiſts of a ſolution of continuity, when as the fleſh and skin are cleft in divers parts with ulcers and chops. The Leproſie hath for the moſt part three general cauſes, that is, the Primitive, Antecedent, and Conjunctive. The Primitive cauſe is either from the firſt conformation, or comes to them after they are born. It is thought to be in him from the firſt conformation, who was conceived of depraved and menſtruous bloud, and ſuch as are inclined to melancholy; who was begot of the leprous ſeed of one or both his Parents, for leprous perſons generate leprous, becauſe the principal parts being tainted and corrupted with a melancholick and venenate juice, it muſt neceſſarily follow, that the whole maſs of bloud and ſeed that falls from it, and the whole body ſhould alſo be vitiated. This cauſe happens to thoſe that are already born, by long ſtaying, and inhabiting in Maritime Countries, whereas the groſs and miſty air, in ſucceſs of time, induceth the like fault into the humours of the body; for that, according to *Hippocrates*, ſuch as the air is, ſuch is the ſpirit, and ſuch the humours. Alſo long abiding in very hot places, becauſe the bloud is torrified by heat, but in cold places, for that they incraſſate, and congealing the ſpirits, do after a manner ſtupifie, may be thought the primitive cauſes of this diſeaſe. Thus in ſome places of *Germany* there are divers leprous perſons; but they are more frequent in *Spain*, and over all *Africa*, than in all the World beſide, and in *Languedoc*, *Provence*, and *Guyenne*, are more than in whole *France* beſides. Familiarity, copulation, and cohabitation with leprous perſons may be reckoned amongſt the cauſes thereof, becauſe they tranſfer this diſeaſe to their Familiars by their breath, ſweat, and ſpittle, left on the edges of the Pots or Cups. This diſeaſe is alſo cauſed by the too frequent uſe of ſalt, ſpiced, acrid and groſs meats, as the fleſh of Swine, Aſſes, Bears, Pulſe, Milk-meats; ſo alſo groſs and ſtrong Wines, Drunkenneſs, Gluttony, a laborious life, full of ſorrow and cares, for that they incraſſate, and as it were burn the bloud. But the retention of melancholick excrements, as the ſuppreſſion of the Hemorrhoids, Courſes, Small Pox, and Meazles, as alſo a Quartan Fever accuſtomed to come at ſet times; the drying up of old ulcers, for that they defile the maſs of the bloud with a melancholick droſs and filth. Now you muſt underſtand, that the cauſe of the Leproſie by the retention of the ſuperfluities, happens, becauſe the corrupt bloud is not evacuated, but regurgitates over the whole body, and corrupts the bloud that ſhould nouriſh all the members; wherefore the aſſimilative faculty cannot well aſſimilate by reaſon of the corruption and default of the juice; and thus in concluſion the Leproſie is cauſed. The Antecedent cauſes are the humours diſpoſed to aduſtion and corruption into melancholy, by the torrid heat; for in bodies poſſeſſed with ſuch heat, the humours by aduſtion eaſily turn into melancholy, which in time acquiring the malignity and corruption of a virulent and venenate quality, yields a beginning and eſſence to the Leproſie. The Conjunct cauſes are the melancholick humours, which are now partakers of a venenate and malign quality, and ſpread over the whole habit of the body, corrupting and deſtroying it firſt by an hot and dry diſtemper, and then by a cold and dry, contrary to the beginnings of life. For hence inevitable death muſt enſue, becauſe our life conſiſts in the moderation of heat and moiſture.

Lib 4. cap. 1. Lib. 2, cap. 11.

There is a certain hidden virulency in the Leproſie.

The primitive cauſe of a Leproſie.

How they may be leprous from their firſt conformation.

The Antecedent cauſe of Leproſie.

The Conjunct cauſe.

How it comes to be deadly.

CHAP. VII.

The ſigns of a Leproſie, breeding, preſent, and already confirmed.

THe diſpoſition of the body and humours to a Leproſie, is ſhewed by the change of the native and freſh colour 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 dryneſs 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 venery above nature and cuſtom. Now there are four times of this diſeaſe, the beginning, increaſe, ſtate, and declenſion. The beginning is, when as the malignity hath not gone further than the inner parts and bowels, whereupon the ſtrength

The beginning of a Leproſie.

ſtrength muſt needs be more languid. The increaſe is, when as the virulency comes forth, and the ſigns and ſymptoms are every 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 profundity and malignity of the ulcers, ſo that none, no not of the common ſort of People, can doubt of this diſeaſe. According to the doctrin of the Ancients, we muſt in ſearching out of the ſigns of this diſeaſe being preſent, have chief regard to the head. For the ſigns of diſeaſes more properly and truly ſhew themſelves in the Face by reaſon of the ſoftneſs and rarity of the ſubſtance thereof, and the tenuity of the skin that covers it; wherefore a black and aduſt humour diffuſed thereunder, eaſily ſhews it ſelf, and that not onely by the mutation of the colour, but alſo of the character, and bulk, and oft-times by manifeſt hurting it. Wherefore you muſt obſerve in the head, whether it have ſcales, 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 preſerve and generate hairs through corruption of the hairy ſcalp that ſhould be ſtored with ſuch nouriſhment, and of the habit it ſelf, and through the unfitneſs thereof to contain hairs: laſtly, by the acrimony of the vapours ſent up from the aduſt humours and entrails, fretting aſunder the roots of the hairs. But if not onely the hair, but alſo ſome portion of the skin and fleſh about the roots of the hair, come away by pulling, it is an argument of perfect corruption: let this therefore be the firſt ſign of a Leproſie. A ſecond and very certain ſign, is a numerous and manifeſt circumſcription of round and hard puſhes or puſtles under the eye-brows, and behind the ears, and in ſeveral places of the Face, reſembling round and hard kernels, occaſioned by the default of the aſſimilating faculty. The cauſe of this default is the groſsneſs of the flowing nouriſhment, by which means it being impact, and ſtopping in the ſtraitneſs of the way, it grows round, as it were compaſſed about in the place whereas it ſticks, and by the means of the crudity, for that it is not aſſimilated, and by delay, it is further hardned. The third ſign is, the more contract and exact roundneſs of the ears, their groſsneſs, and as it were grainy ſpiſſitude or denſneſs; the cauſe of their roundneſs is the conſumption of the flaps and fleſhy part through want of nouriſhment, and exceſs of heat; but the occaſion of their grainy ſpiſſitude is the groſsneſs of the earthy nouriſhment flowing thither. The fourth ſign is a Lion-like wrinkling of the fore-head, which is the reaſon that ſome term this diſeaſe *Morbus Leoninus*; the cauſe hereof is the great drineſs of the habit of the body, which alſo is the reaſon that the bark of an old Oak is rough and wrinkled. The fifth is, the exact roundneſs of the eyes, and their fixt and immoveable ſteddineſs; verily the eyes are naturally almoſt round, yet they appear obtuſe, and ſomewhat broad on the foreſide, but end in a *Canus* on the hind part, by reaſon of the concourſe and figure of the muſcles and fat inveſting them. Therefore theſe being conſumed either through defect of laudable nouriſhment, or elſe by the acrimony of the flowing humour, they are reſtored to their proper figure and roundneſs. Now the muſcles which moved the eyes being conſumed, and the fat which facilitated their motion waſted, it comes to paſs that they ſtand ſtiff and unmovable, being deſtitute of the parts yielding motion, and the facility thereof. The ſixth ſign is, the Noſtrils flat outwardly, but inwardly ſtraight and contracted, that is, an earthy and groſs humour forced from within outwards, which ſwells 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 humour, but they are depreſſed and flatted by reaſon of the reſt of the Face and all the neighbouring parts ſwollen more than their wont; add hereto that the partition is conſumed by the acrimony of the corroding and ulcerating humour. The ſeventh is, the lifting up, thickneſs and ſwelling of the lips, the filthineſs, ſtench and corroſion of the gums by acrid vapours riſing to the mouth; but the lips of leprous perſons are more ſwollen by the internal heat burning and incraſſating the humours, 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; becauſe the Tongue being by nature ſpongeous and rare, is eaſily ſtored with excrementitious humours, ſent from the inner parts unto the habit of the body: which ſame is the cauſe why the glandules placed about the Tongue above and below, are ſwollen hard and round, no otherwiſe then ſcrophulous or mazled Swine. Laſtly, All their Face riſeth in red bunches or puſhes, and is over-ſpread with a dusky and obſcure redneſs; the eyes are fiery, fierce and fixed, by a melancholick cachectick diſpoſition of the whole body, manifeſt ſigns whereof appear in the Face, by reaſon of the fore-mentioned cauſes, yet ſome leprous perſons have their Faces tinctured with a yellowiſh, others with a whitiſh colour, according to the condition of the humour, which ſerves for a *baſis* to the leprous malignity. For hence Phyſicians affirm that there are three ſorts of Leproſies, one of a reddiſh black colour, conſiſting in a melancholick humour; another of a yellowiſh green, in a cholerick humour; another in a whitiſh yellow, grounded upon aduſt phlegm. The ninth ſign is a ſtinking of the breath, as alſo of all the excrements proceeding from leprous bodies, by reaſon of the malignity conceived in the humours. The tenth is, a hoarſneſs, a ſhaking, harſh and obſcure voice, as it were coming out of the Noſe, by reaſon of the Lungs, recurrent Nerves and Muſcles of the Throttle tainted with the groſsneſs of a virulent and aduſt humour; the fore-mentioned conſtriction and obſtruction of the inner paſſage of the Noſe; and laſtly, the aſperity and inequality of the Weazon by immoderate drineſs, as it happens to ſuch as have drunk plentifully of ſtrong Wines without any mixture. This immoderate drineſs of the Muſcles ſerving for reſpiration makes them to be troubled with a difficulty of breathing. The eleventh ſign is very obſervable, which is a Morphew or deſedation of all the skin, with a dry roughneſs and grainy inequality, ſuch as appears in the skins of plucked Geeſe, with many tetters on every ſide, a filthy ſcab, and ulcers not caſting off onely a bran-like ſcurff, but alſo ſcales and cruſts. The cauſe of this dry ſcab is the heat of the burning bowels and humours unequally contracting and wrinkling the skin, no otherwiſe than as leather is wrinkled by the heat of the Sun or Fire. The cauſe of the filthy ſcab and ſerpiginous ulcers, is the eating and corroding condition of the melancholick humour, and the venenate corruption, it alſo being

The increaſe. The ſtate. The declenſion.

The firſt ſign of the Leproſie.

II.

III.

IV. Why it is called *Morbus Leoninus*.

V.

VI.

VII.

VIII.

IX.

X.

XI.

being the author of corruption, ſo that it may be no marvel, if the digeſtive faculty of the liver being ſpoiled, the aſſimilative of a malign and unfit matter ſent into the habit of the body, cannot
XII. well nor fitly perform that which may be for the bodies good. The twelfth is, the ſenſe of a certain pricking as it were of Goads or Needles over all the skin, cauſed by an acrid vapour hindred from
XIII. paſſing forth, and intercepted by 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 body; but becauſe theſe muſcles naturally riſe up unto a certain mountainous tumour, therefore their depreſſion is the more manifeſt. And this is the cauſe 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 ſenſe, or a numbneſs over all the body by reaſon that the nerves are obſtructed by the thickneſs of the melancholick humour hindring the free paſſage of the animal ſpirit, that it cannot come to the parts that ſhould receive ſenſe, theſe in the interim remaining free which are ſent into the muſcles for motions ſake, and by this note I chiefly make trial of leprous perſons, thruſting a ſomewhat long and thick needle ſomewhat deep into the great tendon endued with moſt exquiſit ſenſe, which runs to the heel, which if they do not well feel, I conclude that they are certainly leprous. Now for that they thus loſe their ſenſe, their motion remaining entire; the cauſe hereof is, that the nerves 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 ſomewhat deep, they feel the prick, which they do not in the ſurface
XV. of the skin. The fifteenth is, the corruption of the extreme parts poſſeſſed by putrefaction and a Gangrene, by reaſon of the corruption of the humours ſent thither by the ſtrength of the bowels, infecting with the like tainture the parts wherein they remain: add hereto that the animal ſentitive faculty is there decayed, and as often as any faculty hath forſaken any part, the reſt preſently after a
XVI. manner neglect it. The ſixteenth is, they are troubled with terrible dreams; for they ſeem in their ſleep to ſee Devils, Serpents, Dungeons, Graves, dead bodies, and the like, by reaſon of the black vapors of the melancholick humour troubling the phantaſie with black and diſmal viſions, by which reaſon alſo
XVII. ſuch as are bitten of a mad Dog fear the water. The ſeventeenth is, that at the beginning and increaſe of the diſeaſe they are ſubtil, crafty and furious, by reaſon of the heat of the humours and bloud; but at length in the ſtate and declenſion, by reaſon of the heat of the humours, and bloud, and entrails decaying by little and little; therefore then fearing all things whereof there is no cauſe, and diſtruſting of their own ſtrength, they endeavour by craft maliciouſly to circumvent thoſe with whom
XVIII. they deal, for that they perceive their powers to fail them. The eighteenth, is a deſire of venery 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 humour 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 dry diſtemper, they mightily abhor venery, which then would be very hurtful to them, as it is alſo at the beginning of the diſeaſe, becauſe they have ſmall ſtore of ſpirits and native heat, both which are diſſipated by
XIX. venery. The nineteenth is, the ſo great thickneſs of their groſs and livid bloud, that if you waſh it, you may find a ſandy matter therein, as ſome 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
XX. of the oppreſſion of the vital and pulſifick faculty by a cloud of groſs vapours.) Herewith alſo their urin ſometimes is thick and troubled, like the urin of carriage-beaſts, if the urinary veſſels be permeable and free, otherwiſe it is thin, if there be obſtruction, which onely ſuffers that which is thin to flow forth by the urinary paſſages; now the urin is oftentimes of a pale aſh-colour, and oft-times it ſmells like as the other excrements do in this diſeaſe. Verily there are many other ſigns of the Leproſie, as the flowneſs of the belly by reaſon of the heat of the Liver, often belchings by reaſon that the ſtomach is troubled by the reflux of a melancholick humour, frequent ſneezing by reaſon of the fulneſs of their brain; to theſe this may be added moſt frequently, that the face and all the skin
Why their Faces ſeem to be greaſie. is unctuous or greaſie, ſo that water poured thereon, will not in any place adhere thereto: I conceive it is by the internal heat diſſolving the fat that lies under the skin, which therefore always looks as if it were greaſed or anointed therewith in leprous perſons. Now of theſe fore-mentioned ſigns, ſome are univocal, that is, which truly and neceſſarily ſhew the Leproſie: other ſome are equivocal or common, that is, which conduce as well to the knowledge 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.

CHAP. VIII.

Of Prognoſticks in the Leproſie; and how to provide for ſuch as ſtand in fear thereof.

Why the Leproſie is incurable. THE Leproſie is a diſeaſe which paſſeth to the iſſue, as contagious almoſt as the Plague, ſcarce curable at the beginning, incurable when as it is confirmed, becauſe it is a Cancer of the whole body; now if ſome one Cancer of ſome one part ſhall take deep root therein, it is judged incurable. Furthermore, the remedies which to this day have been found out againſt this Diſeaſe are judged inferiour and unequal in ſtrength thereto. Beſides, the ſigns of this diſeaſe do not outwardly ſhew themſelves before that the bowels be ſeized upon, poſſeſſed and corrupted by the malignity of the humour, eſpecially in ſuch as have the white Leproſie, ſundry of which you may ſee about *Bourdeaux*, and in *Little-Britain*, who notwithſtanding inwardly burn with ſo great heat, that it will ſuddenly wrinkle and wither an Apple held a ſhort time in their hand, as if it had laid for many days

days in the Sun. There is another thing that increaseth the difficulty of this disease, which is an equal pravity of the three principal faculties whereby life is preserved. The deceitful and terrible visions in the sleep, and numbness in feeling, argue the depravation of the animal faculty; now the weakness of the vital faculty is shewed by the weakness of the pulse, the obscurity of the hoarse and jarring voice, the difficulty of breathing, and slinking 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 because we cannot promise cure to such as have a confirmed Leprosie, and that we dare not do it to such as have been troubled therewith but for a short space, it remains that we briefly shew how to free such as are ready to fall into so fearful a disease. Such therefore must first of all thus all things in diet and course of life, whereby the bloud and humours may be too vehemently heated, whereof we have formerly made some mention. Let them make choice of meats of good or indifferent juice, such as we shall describe in treating of the diet of such as are sick of the Plague; Purging, Bleeding, Bathing, Cupping, to evacuate the impurity of the bloud, and mitigate the heat of the Liver, shall be prescribed by some learned Physician. *Valesius de Taranta* much commends gelding in this case, neither do I think it can be disliked; for men subject to this disease may be effeminated by the amputation of their testicles, and so degenerate into a womanish nature, and the heat of the Liver boiling the bloud, being extinguished, they become cold and moist, which temper is directly contrary to the hot and dry distemper of leprous persons; besides the leprous being thus deprived of the faculty of generation, that contagion of this disease is taken away which spreadeth, and is diffused amongst mankind, by the propagation of their issue.

The Cure.

The Diet.

Gelding good against the Leprosie.

The End of the Twentieth Book.

BOOK XXI.

Of POYSONS, *and of the* BITING *of a* MAD DOG; *And the* Bitings *and* Stingings *of other venomous Creatures.*

CHAP. I.

The cause of writing this Treatise of Poysons.

FIve Reasons have principally moved me to undertake to write this Treatise of Poysons, according to the opinion of the Ancients. The first is, that I might instruct the Surgeon what remedies must presently be used to such as are hurt by poisons, in the interim whilest greater means may be expected from a Physician. The second is, that he may know by certain signs and notes such as are poisoned or hurt by poysonous meats, 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 Country, and far from Cities, and store of greater means, may learn something by my labour, by which they may help their friends bitten by an Adder, mad Dog, or other poysonous creatures, in so dangerous, sudden and unusual a case. The fourth is, that every one may beware of poysons, and know their symptoms when present, that being known, they may speedily seek for a remedy. The fifth is, that by this my labour 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 glory of God. I do not here so much arm malicious and wicked persons to hurt, as Surgeons to provide to help and defend each mans life against poyson; which they did not understand, or at least seemed not so to do, which taking this my labour in evil part, have maliciously interpreted my meaning.

But now at length, that we may come to the matter, I will begin at the general division of Poysons, and then handle each *species* thereof severally; but first let us give this Rule, That poyson is that which either outwardly applied or struck in, or inwardly taken into the body, hath power to kill it, no otherwise than meat well drest is apt to nourish it. For *Conciliator* writes that the properties of Poyson are contrary to nourishments in their whole substance; for as nourishment is turned into bloud, and in each part of the body whereto it is applied to nourish, by perfect assimilation substituted in the place of that portion which flies away each moment. Thus on the contrary Poyson turns our bodies into a nature like it self and venenate, for as every agent imprints the force and qualities thereof in the subject patient, thus Poyson by the immoderation of faculties in their whole nature contrary to us, changeth our substance into its nature, no otherwise then fire turneth chaff in a moment into its own nature, and so consumes it. Therefore it is truly delivered by the Ancients, who have diligently pried into the faculties of Natural things, that it is poyson that may kill men by destroying and corrupting their temper, and the compositure and conformation of the body. Now all poysons are said to proceed either from the corrupt Air, or from living Creatures, Plants and Minerals, or by any artificial malignity in distilling, subliming, and diversly mixing of poysonous and fuming things. Hence arise sundry differences of Poysons, neither do they all work after the same manner; for some corrupt our nature by the unmeasurableness of the manifest and elementary qualites whereof they consist, others from a specifick and occult property. Hence it is that

What is to be accounted Poyson.

The differences of Poysons.

All poysons have not a peculiar antipathy with the heart.

that some kill sooner than other some; neither is it true that all of them presently assail the heart, but others are naturally at deadly strife with other parts of the body; as *Cantharides* with the bladder, the Sea-Hare with the Lungs, the *Torpedo* with the hands, which it stupefieth, though the Fishers rod be betwixt them. Thus of Medicins, there are some which are apt presently to comfort and strengthen the heart, others the brain, as *staechas*; others the Stomach, as Cinamon. Also there are some poysons which work both ways, 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, corrupts our nature. An argument hereof is, that Treacle, which by its quality is manifestly hot, infringeth the force thereof, as also of all others of an occult property. Poysons which work by an occult and specifick property, do not therefore do it, because they are too immoderately hot, cold, dry, moist, but for that they are absolutely such, and have that essence from the Stars and celestial influence, which is apt to dissolve and destroy the strength of mans body, because being taken but even in a small quantity, yet are they of so pernicious a quality that they kill almost in a moment. Now Poysons do not only kill being taken into the body, but some being put or applied outwardly; neither do venomous creatures onely harm by their stinging and biting, but also by their excrements, as Spittle, Bloud, the Touch and Breath.

CHAP. II.

How Poysons being small in quantity, may by their onely touch cause so great alterations.

IT seemeth strange to many how it may come to pass, that poyson taken or admitted in small quantity, may almost in a moment produce so pernicious effects over all the body, and all the parts, faculties, and actions; so that being admitted but in a little quantity, it swells up the body into a great bigness. Neither ought it to seem less strange, how Antidotes and Counter-poysons, which are opposed to poyson, can so suddenly break and weaken the great and pernicious effects thereof, being it is not so likely that so small a particle of poyson or antidote can divide it self into so many, and so far severed particles of our body. There are some (saith *Galen*) who think that some things by touch onely, by the power of their quality, may alter those things which are next to them; and that this appears plainly in the Fish *Torpedo*, as that which hath so powerful a quality, that it can send it along the Fishers rod to the hand, and so make it become torpid or numb. But on the contrary, Philosophers teach that accidents, such as qualities are, cannot without their subjects remove and diffuse themselves into other subjects. Therefore *Galen*'s other answer is more agreeable to reason, that so many and great affects of poysons, and remedies arise either from a certain spirit or subtil humidity; not truly, for that this spirit and subtil humidity may be dispersed over the whole body and all the parts thereof which it affects, but that little which is entered the body, as cast in by the stroak of a Spider, or the sting of a Scorpion, infects and corrupts all the next parts by contagion with the like quality, these other that are next to them, until from an exceeding small portion of the bloud, if the stroak shall light into the veins, it shall spread over the whole mass of bloud; or of phlegm, if the poyson shall chance to come to the Stomach, and so the force thereof shall be propagated and diffused over all the humours and bowels. The doubt of Antidotes is less, for these being taken in greater quantity, when they shall come into the stomach, warmed by the heat of the place they become hot, and send forth vapours, which suddenly diffused over the body by the subtilty of their substance, do by their contrary forces dull and weaken the malignity of the poyson. Wherefore you may often see, when as Antidotes are given in less quantity than is fit, that they are less prevalent, neither do they answer to our expectation in overcoming the malignity of the poyson so that it must necessarily follow that these must not onely in qualities, but also in quantity be superiour to Poysons.

cap. 5. lib. 6. de loc. affect.

The true reason of the wondrous effects of poysons.

CHAP. III.

Whether there be any such Poysons as will kill at a set time?

No poysons kill in a set time.

TO the propounded Question: Whether there may be Poysons which within a certain and definite time (put case a Moneth or Year) may kill men? *Theophrastus* thus answers; of Poysons some more speedily perform their parts, others more slowly; yet may you find no such as will kill in set limits of time, according to the will and desire of men: For that some kill sooner or later than others, they do not this of their own or proper nature, as Physicians rightly judge, but because the subject upon which they light, doth more or less resist or yield to their efficacy. Experience sheweth the truth thereof; for the same sort of poyson in the same weight and measure, given to sundry men of different tempers and complexions, will kill one in an hour, another in six hours, or in a day, and on the contrary, will not so much as hurt some third man. You may also observe the same in purging Medicins. For the same Purge given to diverse men in the same proportion, will purge some sooner, some later, some more sparingly, others more plentifully, and othersome not at all; also with some it will work gently, with othersome with pain and gripings. Of which diversity, there can be no other cause assigned, than mens different natures in complexion and temper, which no man can so exactly know and comprehend, as to have certain knowledge thereof, how much and how long the native heat can resist and labour against the strength of poyson, or how pervious or open the passages of the body may be, whereby the poyson may arrive at the heart and principal parts. For in such (for examples sake) as have the passages of their arteries more large, the poyson may more readily and speedily enter into the heart, together with the air that is continually drawn into the body.

How poysons come to kill sooner or later.

CHAP.

CHAP. IV.

Whether such Creatures as feed upon poysonous things, be also poysonous? and whether they may be eaten safely and without harm.

DUcks, Storks, Herons, Peacocks, Turkies, and other Birds, feed upon Toads, Vipers, Asps, Snakes, Scorpions, Spiders, Caterpillers, and other venemous things: Wherefore it is worthy the questioning, whether such like Creatures nourished with such food, can kill or poyson such persons as shall afterward eat them? *Matthiolus* writes, that all late Authors, who have treated of Poysons, to be absolutely of this opinion, That men may safely and without any danger feed upon such Creatures, for that they convert the Beasts into their nature after they have eaten them, and on the contrary are not changed by them. This reason though very probable, yet doth it not make these Beasts to be wholly harmless, especially if they be often eaten or fed upon. *Dioscorides* and *Galen* seem to maintain this opinion, whereas they write that the milk, which is nothing else then the relented bloud of such beasts as feed upon Scammony, Hellebore, and Spurge, purgeth violently. Therefore Physicians desirous to purge a sucking child, give Purges to the Nurses, whence the milk becoming purging, becomes both Meat and Medicin to the Child. The flesh of Thrushes which feed upon Juniper-berries, savours of Juniper. Birds that are fed with Wormwood or Garlick, either taste bitter, or have the strong scent of Garlick. Whitings taken with Garlick, so smell thereof, that they will not forego that smell or taste by any salting, frying, or boiling; for which sole reason, many who hate Garlick, are forced to abstain from these Fishes. The flesh of Rabbits that feed upon Penny-royal and Juniper, savour of them; Physicians wish that Goats, Cows, and Asses whose Milk they would use for Consumptions, or other diseases, should be fed some space before, and every day with these or these herbs which they deem fit for the curing this or that disease: For *Galen* affirms that he doubts not, but that in succes of time the flesh of Creatures will be changed by the meats whereon they feed, and at length savour thereof. Therefore I do not allow that the flesh of such things as feed upon venemous things, should be eaten for food, unless it be some long space after they have disused such repast, and that all the venom be digested and overcome by the efficacy of their proper heat, so that nothing thereof may remain in taste, smell, or substance, but be all vanished away. For many die suddenly, the cause of whose deaths are unknown, which peradventure was from nothing else but the sympathy and antipathy of bodies, for that these things cause death and disease to some, that nourish othersome (according to our vulgar English Proverb, *That which is one mans meat, is another mans poyson.*)

Such things as feed upon poyson may be eaten without danger.

Lib. de simp. facult.

The occasion of sudden death in many.

CHAP. V.

The general signs of such as are poysoned.

WE will first declare what the general signs of poyson are, and then we will descend to particulars, whereby we may pronounce that one is poysoned with this or that poyson. We certainly know that a man is poysoned, when as he complains of a great heavinesse of his whole body, so that he is weary of himself, when as some horrid and loathsom taste sweats out from the orince of the stomach to the mouth and tongue, wholly different from that taste that meat, howsoever corrupted, can send up: when as the colour of the Face changeth suddenly, somewhiles to black, sometimes to yellow, or any other colour, much differing from the common custom of man; when nauseousnes with frequent vomiting troubleth the Patient, and that he is molested with so great unquietnes, that all things may seem to be turned upside down. We know that the poyson works by the proper, and from the whole substance, when as without any manifest sense of great heat or coldnes the Patient swounds often with cold sweats, for usually such poysons have no certain and distinct part wherewith they are at enmity, as *Cantharides* have with the bladder. But as they work by their whole substance, and an occult propriety of form, so do they presently and directly assail the heart, our essence and life, and the fortres and beginning of the vital faculty. Now will we shew the signs whereby poysons that work by manifest and elementary qualities may be known. 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, unquietnes, and perpetual sweats. But if to their exces of heat they be accompanied with a corroding and putrefying quality, as Arsenick, Sublimate, Rose-ager, or Rats-bane, Verdegrease, Orpiment, and the like, they then cause in the stomach and guts intolerable pricking pains, rumblings in the belly, and continual and intolerable thirst. These are succeeded by vomitings, with sweats somewhiles hot, somewhiles cold, with swounings, whence sudden death ensues. Poysons that kill by too great coldnes, induce a dull or heavy sleep, or drowzinesse, from which you cannot easily rowze or waken them; sometimes they so trouble the brain that the Patients perform many undecent gestures and antick tricks with their mouths, eyes, arms, and legs, like as such as are frantick; they are troubled with cold sweats, their Faces become blackish or yellowish, always ghastly, all their bodies are benumbed, and they die in a short time, unless they be helped; poysons of this kind are Hemlock, Poppy, Night-shade, Henbane, Mandrag. Dry poysons are usually accompanied by heat with moisture, for although Sulphur be hot and dry, yet hath it moisture to hold the parts together, as all things which have a consistence have; yet they are called dry, by reason that drines is predominant in them: such things make the tongue and throat dry and rough, with unquenchable thirst; the belly is so bound, that so much as the urin cannot have free passage forth; all

Common signs of such as are poysoned.

Signs of hot poysons.

Signs of cold Poysons.

Signs of dry Poysons.

Signs of moist Poisons.

all the members grow squalid by drineſs, the Patients cannot ſleep: poyſons of this kind are Litharge, Ceruſs, Lime, Scales of Braſs, Filings of Lead, prepared Antimony. On the contrary, moiſt poiſons induce a perpetual ſleep, a flux or ſcouring, the reſolution of all the nerves and joints, ſo that not ſo much as the eyes may be faithfully contained in their orbs but will hang as ready to fall out; the extreme parts, at the Hands, Feet, Noſe, and Ears corrupt and putrifie, at which time they are alſo troubled with thirſt by reaſon of their ſtrong heat, always the companion of putrefaction and oft-times the author thereof: now when this cometh to paſs death is at hand. Very many deny that there can be any moiſt poyſons found, that is, ſuch as may kill by the efficacy of their humidity, becauſe there are no ſuch things to be found as may come to the fourth degree of moiſture. Yet there is an example that averrs the contrary, 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 being putrefied, fell off, and preſently the bones alſo fell aſunder, being deprived of their fleſh, which could not happen unleſs by exceſs of the venemous humidity which lay hid in the teeth and ſpittle of the Serpent. Alſo we have found it noted by *Hippocrates*, that in a rainy, humid, and ſoutherly conſtitution of the Year, it happened by the malign violence of the venenate and putrefying humidity, that the fleſh of the arms and legs becoming rotten, fell away by piece-meal, and the bones remained bare; yea alſo and the bones themſelves in ſome, putrefied and fell away: neither certainly doth the *Lues Venerea* kill by any other means than by a fretting and putrefying force of humidity, by whoſe efficacy the ſolidity of the bones is diſſolved, then much more the fleſh may be tainted and conſumed by putrefaction.

An Hiſtory.

Still. 3. lib. 3. Epid.

The *Lues Venerea* kills by exceſs of moiſture.

To theſe and ſuch poyſons which work by a manifeſt and elementary faculty, when as they ſhall be received into the body after what manner ſoever, you ſhall forthwith oppoſe their contraries; and if by chance it be not manifeſt what, and of what diſtinct kind 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 body, but onely by Experience. Therefore to theſe you muſt oppoſe their like Antidotes, which may by their whole ſubſtance ſtrengthen the heart and vital faculty, and withſtand the ſtrength of the poiſon. But to this our diſtinction of poiſons, working by a manifeſt and elementary quality, their opinion is contrary, 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 be colder than a ſtone. And that Serpents for fear of cold, when as Winter is at hand keep themſelves in holes and dens under ground, or elſe as Vipers uſe to do, lie under ſtones, under which you may often find them ſtiff and numb, and ſo unapt for motion, that you may eaſily take them up in your hand. But the coldneſs that is perceived or felt in ſuch as are bitten or ſtung, is not occaſioned by the coldneſs of the poiſon, but by the abſence of the natural heat, withdrawing it ſelf in the very inſtant of the ſtroak, from the ſurface into the center of the body, both for the defence of the heart, as the principal part, as alſo for that there is nothing which ſo much diſſipates, or ſo much oppugns the vital heat as poiſon (of what kind ſoever it be) doth.

All poiſons are not cold.

Why ſuch as are poyſoned or ſtung, are cold.

CHAP. VI.

How, or by what means to ſhun or eſchew Poyſons.

IT is a matter of much difficulty to avoid poiſons, becauſe ſuch as at this time temper them, are ſo throughly prepared for deceit and miſchief, that they will deceive even the moſt wary and quick-ſighted; for they ſo qualifie their ingrate taſte and ſmell, by the admixture of ſweet and well ſmelling things, that they cannot eaſily be perceived even by the skilful. Therefore ſuch as fear poiſoning, ought to take heed of meats cooked with much Art, very ſweet, ſalt, ſowre, or notably endued with any other taſte. And when they are oppreſt with hunger or thirſt, 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 poyſons, ſuch as is the fat broth of good nouriſhing fleſh meats; in the morning let them arm themſelves with Treacle or Mithridate, and conſerve of Roſes, or the leaves of Rue, a Walnut, and dry Figs; beſides, let him preſently drink a little draught of Muskedine, or ſome other good Wine; when one ſuſpects he 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 conſumes 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 body by ſleep. Wherefore in ſuch a caſe it is better to procure Vomit by drinking *Hydræleum* 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 elſe the acrimony thereof retunded, and the belly looſed.

What ſuch as fear poiſoning muſt obſerve in their diet.

Why ſleep is hurtful.

Why and how Vomit muſt be procured.

You may ſee this by dayly experience, for Cauſticks, Veſicatories, and the like acrid things being applied to the anointed part, will not bliſter nor exulcerate the part. Neither doth the Vomit conduce onely in this, that it excludeth the poiſon, but it ſhews either by the Taſte, Smell, or Colour, the kind of the taken poiſon; ſo that then by uſing the proper Antidote, it may be the more eaſily and ſpeedily reſiſted, yet notwithſtanding if you conceive that the poiſon have deſcended deeper into the Guts, you may with a Clyſter draw away the reſt thereof which adheres to the Coats of the Guts. But if the Patient cannot vomit, then ſhall ſome purging Medicin be given him forthwith, and ſuch as are thought more particularly to reſiſt poiſon; ſuch as are Agarick, Aloes, the leſſer Centaury, Rubarb, and other things, according to the direction of the learned Phyſician. Then ſhall you adminiſter Clyſters made with

When and wherewith they ſhall be purged.

with *Cassia*, fatty decoctions, Sheeps 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 Dysentery, or bloudy flux, that such things may hinder the adhesion of the poyson to the coats of the guts, and by their unctuousness retund the acrimony of the poyson, and mitigate if any thing shall already be ulcerated, and absolutely defend the sound parts from the malign effects of the poyson. But let this be a perpetual rule, that the poyson be speedily drawn back by the same way it entered into the body; as if it entered by smelling, in at the Nostrils, let it be drawn back by sneezing; if by the mouth into the stomach, let it be excluded by vomit; if by the fundament into the belly then by clyster; if by the Privities into the Womb, then by metrenchites or injections made thereinto; if by a bite, sting, or wound, let revulsion be made by such things as have a powerful attractive faculty: for thus we make diversions, that by these we may not onely hinder the poyson from assailing the heart, but also that by this means we 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 sundry parts of the body are good. Also baths of warm water, with a decoction of such things as resist Poyson, Southern-wood, Calamint, Rue, Betony, Horehound, Penny-royal, Bays, Scordium, Smallage, Scabious, Mints, Valerian, and the like, are good in this case. Also Sweats are good, being provoked so much as the strength of the Patient can endure. But if he be very wealthy, whom we suspect poysoned, it will be safer to put him into the belly of an Ox, Horse, or Mule, and then presently into another as soon as the former is cold, that so the poyson may be 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 be had.

The cure of poysoned wounds.

CHAP. VII.

How the corrupt or venemous Air may kill a man.

THe Air is infected and corrupted by the admixture of malign vapours, either arising from the unburied bodies of such as are slain in great conflicts, or exhaling out of the earth after Earthquakes; for the air, long pent up in the cavities and bowels of the earth, and deprived of the freedom and commerce of the open air, is corrupted, and acquires a malign quality, which it presently transferreth unto such as meet therewith. Also there is a certain malignity of the air, which accompanies Thunders and Lightnings, which savours of a sulphureous virulency, so that whatsoever wild Beasts shall devour the Creature killed therewith, they become mad, and die immediately; for the fire of Lightning hath a far more rapid, subtil, and greater force than other fires, so that it may rightly be termed a Fire of Fires.

By how many, and what means the air may be infected.

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 Purse wherein it is contained. Also the air is infected by fumigations which presently admitted into the body and bowels by the mouth and nose in respiration, by the skin and arteries in perspiration, doth easily kill the spirits and humours being first infected, and then within a short space after the solid substance of the principal parts, and chiefly of the heart being turned into their nature, unless the man be first provided for by Sneezing, Vomiting, Sweating, purging by the belly, or some other excretion. For that poyson which is carried into the body by smell, is the most rapid and effectual, by so much as a vapour or exhalation is of more subtil and quicklier-piercing essence than an humour. Yet notwithstanding, wilt thou say, it is not credible, that any be killed by any vapour raised by the force of fire, as of a Torch or Warming-pan, for that the venemate quality of the thing that is burnt, is dissipated and consumed by the force of the fire, purging and cleansing all things. This reason is fatly feigned to the destruction of the lives of careless people; for sulphureous brands kindled at a clear fire, do notwithstanding cast forth a sulphurous vapour. Whether do not *Lignum aloes* and Juniper, when they are burnt in a flame, smell less sweetly?

Whether the vapour that ariseth from a burnt thing may poyson one.

Pope *Clement*, the seventh of that name, the Uncle of our Kings Mother, was poysoned by the fume of a poysonous Torch that was carried lighted before him, and died thereof. *Matthiolus* telleth, that there were two Mountebanks in the Market-place of *Sienna*, the one of which but smelling to a poysoned Gilly-flower given him by the other, fell down dead presently.

An History.

A certain man not long ago, when he had put to his nose, and smelled a little unto a pomander, which was secretly poysoned, was presently taken with a *Vertigo*, and all his face swelled, and unless that he had gotten speedy help by Sternutatories and other means, he had died shortly after of the same kind of death that Pope *Clement* did.

The safest preservative against such poysons is, not to smell to them: moreover some affirm, that there are prepared some Poysons of such force, that being anointed but on the Saddle, they will kill the Rider; and others, that if you but anoint the Stirrups therewith, they will send so deadly poysonous a quality into the Rider through his Boots, that he shall die thereof within a short time after: which things, though they be scarce credible, because such poysons touch not the naked skin, yet have they an example in Nature, whereby they may defend themselves; for the *Torpedo* sends a narcotick, and certainly deadly force into the arm, and so into the body of the Fisher, the cords of the Net being between them.

CHAP.

CHAP. VIII.

That every kind of Poyſon hath its proper and peculiar Signs and Effects.

AS Poyſons are diſtinct in *ſpecies*, ſo each *ſpecies* differs in their Signs and Effects; neither is it poſſible to find any one kind of poyſon which may be accompanied with, or produce all the ſigns and effects of all poyſons, 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 kind of poyſon ſhall that be which ſhall cauſe a burning heat in the Stomach, Belly, Liver, Bladder, and Kidnies, which ſhall cauſe a hicketting, which ſhall cauſe the whole body to tremble and ſhake, which ſhall take away the voice and ſpeech, which ſhall cauſe convulſions, ſhall weaken the pulſifick faculty, which ſhall intercept the freedom of breathing, which ſhall ſtupifie and caſt into a dead ſleep, which ſhall together and at once cauſe a *Vertigo* in the head, dimneſs in the ſight, a ſtrangling or ſtoppage of the breath, thirſt, bleeding, fever, ſtoppage of the urin, perpetual vomiting, redneſs, lividneſs, and paleneſs of the face, reſolutions of the powers, and many other things, all which are cauſed by all ſorts of poyſon. Laſtly, No body will deny but that hot poyſons may kill more ſpeedily than cold, for that they are more ſpeedily actuated by the native heat.

Hot poyſons kill ſooner than cold.

CHAP. IX.

The Effects of Poyſons from particular venemous things, and what Prognoſticks may thence be made.

IT is the opinion of *Cornelius Celſus*, and almoſt of all the Ancients, that the bite of every Beaſt hath ſome virulency, but yet ſome more than otherſome. They are moſt virulent that are inflicted by Venemous Beaſts, Aſps, Vipers, Water-Snakes, and all kinds 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 many other things, which though of their own nature they are without poiſon, yet in their bites there is ſomething more dolorifick and ill-natured than in common wounds inflicted by other occaſions: I believe, that in their ſlaver or *ſanies*, there is ſomething, I know not how to term it, contrary to our nature, which imprints a malign quality in the ulcer, which alſo you may obſerve in the tearings or ſcratchings of ſuch Creatures as have ſharp claws, as Lions and Cats. Moreover many affirm, that they have found by experience, that the bites of Men are not altogether without virulency, eſpecially of ſuch as are red haired and freckled, chiefly when as they are angred; it is probable that the bites of other perſons want this malignity, ſeeing that their ſpittle will cure ſmall ulcerations. Wherefore if there ſhall happen difficulty of cure in a wound, cauſed by a mans biting, which is neither red haired, nor freckled, neither angry, this happens not by means of the ſpittle, nor by any malign quality, but by reaſon of the contuſion, cauſed by the bluntneſs of the teeth, not cutting, but bruiſing the part; for being not ſharp they cannot ſo eaſily enter the fleſh, unleſs by bruiſing and tearing, after the manner of heavy and blunt ſtroaks and weapons, wounds being occaſioned by ſuch, are more hard to be cured than ſuch as are made by cutting and ſharp Weapons. But of the fore-ſaid bitings of Venemous Creatures, there are few which do not kill in a ſhort ſpace, and almoſt in a moment, but principally if the poyſon be ſent into the body by a live Creature, for in ſuch poyſon there is much heat, alſo there is therein a greater tenuity, which ſerves as *vehicles* thereto, into what place or part ſoever of the body they tend, the which the poyſons taken from the dead Creatures are defective of. Wherefore ſome of theſe kill a man in the ſpace of an hour, as the poyſon of Aſps, Baſilisks, and Toads; others not unleſs in two or three days ſpace, as of Water-Snakes; a Spider and Scorpion require more time to kill, yet all of them admitted but in the leaſt quantity, do in a ſhort ſpace cauſe great and deadly mutations in the body, 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 pernicioufneſs of the poyſon; for ſuch as live in dry mountains and Sun-burnt places, kill more ſpeedily than ſuch as be in moiſt and mariſh grounds; alſo they are more hurtful in Winter than in Summer; and the poyſon is more deadly which proceeds from hungry, angry, and faſting Creatures, than that which comes from ſuch as are full and quiet; as alſo that which proceeds from young things, chiefly when as they are ſtimulated to Venery, is more powerful than that which comes from old and decrepit; from Females worſe than from Males; from ſuch as have fed upon other venemous things, rather than 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 efficacy of poyſons depends from their proper, that is, their ſubtil or groſs conſiſtence, and the greater or leſs aptneſs of the affected body to ſuffer. For hot men that have larger and more open veins and arteries, yield the poyſon freer paſſage to the heart: Therefore they which have more cold and ſtrait 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 poyſon ſo free paſſage, they alſo ſtrengthen the heart by the multiplication of ſpirits, ſo that it more powerfully reſiſts pernicious venom. If the poyſon work by an occult and ſpecifick property, it cauſeth the Cure and Prognoſtick to be difficult, and then muſt we have recourſe to Antidotes, as theſe which have their whole ſubſtance refuſe poyſons; but principally to Treacle, becauſe there enter into the Compoſition thereof Medicins which are hot, cold, moiſt, and dry: whence it is, that it retunds and withſtands all poyſons, chiefly ſuch

*Lib.*2. *cap.*27. The bites of all wild Beaſts are virulent.

The bites of a red-haired man virulent

Contuſed wounds harder to heal than ſuch as are cut.

Why Treacle retunds the force of all ſimple poyſons.

as consist of a simple nature: such as these which come from venemous Creatures, Plants, and Minerals, and which are not prepared by the detestable Art of empoisoners.

CHAP. X.

What Cure must be used to the bitings and stingings of venemous Beasts.

CUre must speedily be used without any delay to the bites and stingings of venemous Beasts which may by all means disperse the poison, and keep it from entering into the body; for when the principal parts are possessed, it boots nothing to use Medicins afterwards. Therefore the Ancients have propounded a double Indication to lead us to the finding out of Medicins in such a case, to wit, the evacuation of the virulent and venenate humour, and the change or alteration of the same and the affected body. But seeing evacuation is of two sorts, to wit, Universal, which is by the inner parts; and Particular, which is by the outward parts: We must begin at the particular, by such to pick Medicins as are fit to draw out and retund the venom; for we must not always begin a Cure with general things, as some think, especially in external diseases, as Wounds, Fractures, Dislocations, Venemous Bites and Punctures. Wherefore hereto as speedily as you may, you shall apply remedies fit for the Bites and Punctures of venemous Beasts; as for example, the Wounds shall be presently washed with Urin, with Sea-water, *Aqua Vitæ*, or Wine, or Vinegar wherein old Treacle or Mustard shall be dissolved. Let such washing be performed very hot, and strongly chased in, and then leave upon the Wound and round about it, linnen rags, or lint steeped in the same liquor. There be some who think it not fit to lay Treacle thereto, because as they say, it drives the poison in. But the authority of *Galen* convinceth that opinion, for he writeth that if the Treacle be applied to this kind of wounds before that the venom shall arrive at the noble parts, it much conduceth. Also reason confutes it, for Vipers 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 Medicins which enter this composition, resolve and consume the virulency and venom, and being 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 Medicins that are taken inwardly and applied outwardly for evacuation, must be of subtil parts, that they may quickly insinuate themselves into every part to retund the malignity of the poison; wherefore Garlick, Onions, Leeks, are very good in this case, for that they are vaporous; also *Scordium, Rue, Dictamnus*, the lesser Centaury, Hore-hound, Rocket, the milky juice of unripe figs, and the like, are good; there is a kind of wild Bugloss amongst all other Plants, which hath a singular force against venemous bites, whence it is termed *Echium* and *Viperium*, and that for two causes; the first is, because in the purple flowers that grow amongst the leaves, there is a resemblance to the head of a Viper or Adder. Another reason is, because it heals the biting of a Viper, not onely applied outwardly, but also helpeth such as are bitten being drunk in Wine, yea and will not suffer those that have lately drunk thereof to be bitten at all. Wild *Tyme* hath the like effect, though these oft-times agree with the poison in quality as in heat, yet do they help in discussing and resolving it; yet, as much as we may, we must labour to have evacuation and alteration together. It is most convenient, if the part affected will permit, to apply large Cupping-glasses with much flame and horns; also sucking is good, the mouth being 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 be the mouth be no where ulcerated. It is good also to apply Horse-leeches, some wish to apply to the wound the fundaments of Hens or Turkies that lay Eggs, for that such are opener behind, first putting salt upon them that they may gape the wider, shutting their beaks and opening them now and then, lest they should be stifled, and ever and anon to substitute others in stead 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 be others which had rather apply to the wound live Birds cut asunder in the midst, and so laid to the wound hot, for that they guess 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 sotten Sand, Stones, and most dry and stony seeds in their gizzards; wherefore we must think them very good to draw out the poison and dissipate it. But nothing is so forcible to disperse and retund the venom, as the impression of Cauteries, especially actual, for a hot iron works more effectually and speedily, and causeth an ulcer which will remain open a longer time. Wherefore to cause the speedier falling away of the Eschar, you shall scarifie it to the quick, and then plentifully anoint the place. For thus the poison will the sooner pass forth. But this must be done before the poison enters far into the body, for otherwise Cauteries will not onely do no good, but further torment the Patient, and weaken him to no purpose. Let drawing plasters be laid to the wound and neighbouring parts, made of *Galbanum*, Turpentine, black Pitch, and other gummy and resinous things. After the falling away of the Eschar *Basilicon* shall be 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 be closed speedily. To which purpose they put in a piece of sponge, or a root of Gentian or Hermodactyl, or some acrid Medicin, as *Ægyptiacum* or *Precipitate* mixed with the powder of Alum, or a caustick beaten to powder. But you must always observe this, that with your ointments you must always mix some Treacle or Mithridate, or the juice of *Hypocistis*, or the like, which have power to attract and disperse the poison, and cleanse the ulcer; yet if too vehement heat shall cause such pain as is likely to bring a Gangrene by the dissipation of the spirits, then neglecting the cure of the proper disease for a time, we must labour to correct the symptom. But in this case you must observe this rule, that you let no blood, give no purging Medicin nor Clyster,

A double indication in the cure of venemous bites.

Lotions fit for venemous bites.

Lib. de Theriac.

Treacle outwardly applied and inwardly taken good against venomous bites.

The force of *Echium*.

The efficacy of Cauteries against venemous bites.

The force of *Precipitate* against venemous wounds.

When hot things are not convenient for poisoned wounds.

Clyſter, nor Vomit, nor uſe no Bath, nor other thing that may procure ſweat, until three days be paſt after the bite or ſting. In the mean ſpace let the Patient ſhun all manner of labour, but chiefly Venery, leſt by cauſing an agitation of the humours, 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 body beſides. Before you ſhall give nothing, unleſs Medicins of Treacle and Mithridate, and the like things, which have a faculty to reſiſt poiſon, and ſtrengthen the whole body by their benign and vital vapour, although their ſubſtance go no further than the ſtomach. Thus Pills when they are ſwallowed, though they go no further than the ſtomach, yet do they draw matter out of the joints and head; and ſtrong Clyſters, though they paſs no further than the guts, yet by their quality diffuſed further with the vapour, they draw from the moſt diſtant parts; yet you muſt give an Antidote, not onely more powerful than the poiſon in quality, but alſo greater in quantity, that ſo it may the more eaſily overcome and expel the poiſon. Wherefore you muſt give it twice in a day, and continue it ſo long until you ſhall know that the ſtrength of the poiſon is weakned and overcome by the remiſſion and decay of the malign ſymptoms. Yet in the mean while you muſt not neglect the diſtemper cauſed in the part by the poiſon, but muſt rather correct it by the application of the remedies contrary to the diſtemper, as by cold things if great heat afflict the affected part and whole body; by hot things on the contrary, if it ſeem as cold as a ſtone, which oft-times happens. And let thus much ſuffice for the general cure of Poiſons: now will we come to their particular Cure.

Antidotes muſt be given in great quantities.

CHAP. XI.

Why Dogs ſooner become mad than other Creatures, and what be the ſigns thereof.

Dogs naturally ſubject to madneſs.

DOgs become mad ſooner than any other Creatures, becauſe naturally they enjoy that temper and condition of humours which hath an eaſie inclination to that kind of diſeaſe, and as it were a certain diſpoſition, becauſe 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, makes them to run every way, painfully ſearching and ſmelling to every thing and neglecting their meat. An heating of the bloud enſues upon this pain, and by this heat it is turned into a melancholy, whence they become mad. But yet Dogs do not always become mad by means of heat, but alſo by occaſion of cold, that is, by contrary cauſes; for they fall into this diſeaſe not onely in the Dog-days, but alſo in the depth of Winter: For Dogs abound with melancholick humours, to wit, cold and dry. But ſuch humours as in the Summer through exceſs of heat, ſo in the depth of Winter by conſtipation and the ſuppreſſion of fuliginous excrements, they eaſily turn into melancholy. Hence follows a very burning and continual Fever, which cauſeth 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 breeds and turns the humours into melancholy. Alſo Dogs become mad by contagion, as ſuch as are bitten by another mad Dog. A mad Dog hath ſparkling and fiery eyes, with a fixed look, cruel and aſquint, he carries his head heavily, hanging down towards the ground, and ſomewhat on one ſide, he gapes and thruſts forth his tongue, which is livid and blackiſh; and being ſhort breathed, caſts forth much filth at his noſe, and much foaming matter at his mouth; in his gate, as if he ſuſpected and feared all things, he keepeth no one or certain path, but runs one while to this ſide, another while to that, and ſtumbling like one that is drunk, he oft-times falleth down on the ground; he violently aſſails whatſoever he meets withall, whether it be Man, Tree, Wall, Dog, or any thing elſe; other Dogs ſhun and preſently ſcot him afar off. But if another unawares chance to fall foul upon him, he yields himſelf to his mercy, fawns upon him, and privily labours to get from him, though he be the ſtronger and greater. He is unmindful of eating and drinking, he barks not, yet bites he all he meets, without any difference, not ſparing his Maſter, as who at this time he knows not from a ſtranger or enemy. For it is the property of Melancholy 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 themſelves. But when as he ſees Water, he trembles and ſhakes, and his hairs ſtand up on end.

Dogs become mad, not onely in the heat of Summer, but alſo in the depth of Winter.

Why melancholick perſons hurt themſelves.

CHAP. XII.

By what ſigns we may know a man is bitten by a mad Dog.

The bite of a mad Dog not very painful at the firſt.

IT is not ſo eaſie at the firſt to know that a man is bitten with a mad Dog, and principally for this reaſon, becauſe the wound made by his teeth cauſeth no more pain than other wounds uſually do; contrary to the wounds made by the ſting or bite of other poiſonous Creatures, as thoſe which preſently after they are inflicted, cauſe ſharp pain, great heat, ſwelling, and abundance of other malign accidents according to the nature of the poiſon; but the malignity of the bite of a mad Dog appears not before that the venom ſhall invade the noble parts. Yet when you are ſuſpicious of ſuch a wound, you may acquire a certain knowledge and experience thereof by putting a piece of bread into the quitture that comes from the wound. For if a hungry Dog neglect, yea more fly from it, and dare not ſo much as ſmell thereto, it is thought to be a certain ſign that the wound was inflicted by a mad Dog. Others add, That if any give this piece of bread to hens, that they will die the ſame day they have eaten it; yet this latter I making experiment thereof, failed; for devouring this virulent bread, they became not a jot the worſe. Wherefore I think the former ſign to be the more certain, for Dogs have a wonderful and ſure ſmelling faculty, whereby they eaſily ſcent and perceive the malignity of the like Creature. But when as

Signs of the bite of a mad Dog.

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the raging virulency hath invaded the noble parts, then the Patients, becoming silent and sorrowful, think of many things, and at the beginning make a noise with their teeth; they make no answer to the purpose, they are more testy than ordinary, and in their sleeps they are troubled with dreams and strange phantasies, and fearful visions; and lastly, they become afraid 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 memory, senses, reason, and judgment is extinguished. Wherefore becoming stark mad, they know not such as stand by them, nor their friends, no nor themselves, falling upon such as they meet withall, and themselves with their teeth and nails and feet. Often twitchings like Convulsions do suddenly rise in their limbs; I judge them occationed by extraordinary drineſs, which hath as it were wholly drunk up all the humidity of the nervous parts; there is a great drineſs of the mouth with intolerable thirst, yet without any desire of drink, because the mind being troubled, they become unmindful and negligent of such things as concern them, and are needful for them; the eyes look fiery and red, and all the face is of the same colour; 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 humour hath changed all the humours and the whole body into the like nature, so that they think themselves also Dogs; whence their voice becomes hoarse by much endeavouring to bark, having forgot all decency, like impudent Dogs, to the great horrour of the beholders. For their voice grows hoarse by reason of the great drineſs of the *asperæ arteriæ*; they shun the light, as that which is enemy to melancholy, wherewith the whole substance of the Brain is repleniſhed; on the contrary they desire darkneſs, as that which is like and friendly to them. But they are afraid of the water (though good to mitigate their great distemper of heat and drineſs) and they fly from Looking-glasses, because they imagine they see Dogs in them, whereof they are much afraid, by reason whereof they shun the Water and all polite and clear bodies which may supply the use of a Looking-glass; so that they throw themselves on the ground, as if they would hide themselves therein, lest they should be bitten again: for they affirm that he which is bitten by a mad Dog, always hath a Dog in his mind, and so remains fixed in that sad cogitation. Wherefore thinking that he sees him in the Water, he trembles for fear, and therefore shuns the Water. Others write that the body by madneſs becometh wondrous dry, wherefore they hate the Water, as that which is contrary thereto, being absolutely the moistest element; and so they say that this is the reason of their fearing the Water. *Ruffus* writes that madneſs is a kind of melancholy, and that fear is the proper symptom thereof, according to *Hippocrates*; wherefore this of that kind of melancholy begets a fear of these or these things, but chiefly of bright things, such as Looking-glasses and Water, by reason that melancholy persons seek darkneſs and solitariness, by reason of the black corruption of the humour wherewith they abound. They fall into cold sweats, a foamy, stinking, and greenish matter flows from the ulcer, by reason of the heat of the antecedent cause and ulcerated part. The urin most commonly appears watery, by reason that the strainers, as it were of the Kidnies, are straitned by the heat and drineſs of the venom. Yet sometimes also it appears more thick and black, as when Nature powerfully using the expulsive faculty, attempts to drive forth by urin the melancholy humour, the seat of the venom. Also sometimes it is wholly suppreſt, being either incrassated by hot drineſs, or else the mind being carried otherways and forgetful, of its own duty, until at length the Patients, vexed by the cruelty of so many symptoms, and overcome by the bitterness of pain, die frantick, by reason that Medicins 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 becoming mad, bark like dogs.

Why they shun the light.

Why they are afraid 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.

Prognostick.

WE cannot so easily shun the danger we are incident to by mad Dogs, as that of other Beasts, by reason he is a domestick creature, and housed under the same roof with us. The virulency that resides in his foam or slaver is hot and dry, malign venenate and contagious, so that it causeth a distemper like it self, in the body whereto it shall apply it self and spread it self over the whole body 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 be forthwith washed away with salt water or urin. Neither doth this venom hurt equally or at all times alike, for it harms more or less, according to the inclination of the air to heat or cold, the depth of the wound, the strength of the Patients Body, and the ill humours thereof, and their disposition to putrefaction, the freedom and largeness of the passages. Now malign symptoms happen sooner or later, as in some about the fortieth day, in others about six moneths, and in others a year after. There be some 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* thinks their case is not desperate, 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 we shall shew hereafter. *Actius* tells that there was a certain Philosopher, who taken with this disease, and a fear of Water, when as he descended with a great courage unto the Bath, and in the Water beholding the shape of the Dog that bit him, he made a stand, but ashamed thereof, he forthwith cried out, *Quid Cani cum Balneo? i. e.* What hath a Dog to do with a Bath? which words being uttered, he threw himself forcibly into the Bath, and fearlessly drank of the Water thereof, and so was freed from his disease together with his erroneous opinion. It is a deadly sign to tumble themselves on the ground to have an hoarse voice, for that is an argument that the weazon is become rough, by reason of too excessive

The venom of a mad dog applied outwardly onely, may cause madness.

Whether the *Hydrophobia*, or fear of Water be incurable.

An History.

drineſs. Finally, The principal parts being poſſeſſed, there is no recovery or life to be hoped for. Men may well fall mad, though they be not bit by a mad dog. For as the humours are often inflamed of themſelves, and cauſe a Cancer or Leproſie, ſo do they alſo Madneſs in melancholick perſons. The bites of Vipers and other venemous creatures cauſe not like ſymptoms to theſe that come by the biting of a mad Dog, becauſe they die before ſuch can come forth or ſhew themſelves. Great wounds made by mad Dogs are not equally ſo dangerous as little, for from the former great plenty of venemous matter flows out, but in the latter it is almoſt all kept in.

CHAP. XIV.

What cure muſt be uſed to ſuch as are bitten by a mad Dog.

An Hiſtory.

THis caſe alſo requires ſpeedy remedies; for ſuch things are in vain which come long after the hurt. The Lawyer *Baldus* experienced this to his great harm, for being by chance lightly bit in the lip by a little Dog wherewith he was delighted, not knowing that he was mad, and neglecting the wound by reaſon of the ſmalneſs thereof, after ſome four moneths ſpace he died mad, having then in vain aſſayed all manner of Medicins. Wherefore obſerving theſe things both for evacuation, as alſo for alteration, which we 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, we muſt draw forth the venom, and if the wound be large, then ſuffer it to bleed long and much, for ſo ſome part of the poiſon will be exhauſted; if it be not great it ſhall be enlarged by ſcarification, or an occult cautery, neither ſhall it be healed or cloſed up at the ſooneſt till forty days be paſſed. Sorrel beaten and applied to the wound, and the decoction thereof taken inwardly, is very effectual in this caſe, as *Aetius* affirms. To the ſame purpoſe you may with good ſucceſs make a lotion and friction with Muſtard diſſolved in Urin or Vinegar, leaving upon the wound a double cloth moiſtned in the ſame decoction: laſtly, all acrid, biting, and very attractive Medicins are convenient in this caſe. Wherefore ſome apply Rocket boiled and beaten with Butter and Salt, others take the flower of *Orobus*, and temper it with Honey, Salt, and Vinegar, and apply it hot. Horſe-dung boiled in ſharp Vinegar, or Brimſtone beaten to powder, and tempered with ones ſpittle, is good. Alſo black pitch melted with ſome ſalt, and a little *Euphorbium* mixed therewith, and ſo applied, is good. Some write that the hairs of the Dog whoſe bite cauſed the madneſs, applied by themſelves, by their ſympathy 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, reſtores the Patient to health, both theſe by often experience are affirmed to have certain event. Others chew unground Wheat, and lay it upon the wound, other roaſt Beans under hot Embers, then huſk them and cleave them, and ſo apply them. Alſo the wound may be wholſomly waſhed and fomented with a decoction of Docks, and then the herb beaten may be applied thereto; alſo the Patient may drink the decoction; and by this one remedy *Aetius* affirms that he hath recovered divers; for thus it moves Urin plentifully, which is thought much to conduce to the cure of this diſeaſe. There be ſome who apply the leaves of Betony and Nettles beaten with common Salt; others make a Medicin to the ſame purpoſe, and after the ſame manner, of an Onion, the leaves of Rue, and Salt. Yet the reſt are exceeded by Treacle diſſolved in *Aqua Vitæ* or ſtrong Wine, and rubbed hard upon the paſt, ſo that bloud may follow, laying upon the wound when you have wiped it, cloths dipped in the ſame Medicin; then preſently apply Garlick or Onions beaten with common Salt and Turpentine. By this onely remedy I freed one of the daughters of *Madamoiſella de Gron* from the ſymptoms of madneſs, and 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 be ſome who wiſh to eat the roaſted liver of the Dog that hurt them, or elſe 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 be drunk with Wine and Butter. Others the powder of River-Crabs burnt and drunk in Wine. Or, ℞ *Rad. gent.* ʒ ij. *aſtacorum fluviat. in fumo combuſt. & in pollinem redacti.* ʒ iij. *terræ ſigill.* ʒ ß. *miſce.* Give ʒ j. of this ſame Powder in the decoction of River-Crabs, and let them drink thereof ott, at ſundry times. Many have caſt themſelves into the Sea, neither have they thence had any help againſt Madneſs, as *Ferrand Pozet* the Cardinal teſtifieth in his Book of Poiſons; wherefore you muſt not rely upon that remedy, but rather you muſt have recourſe 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 be taken or admitted into the body, we muſt not fear any harm by ſprinkling our bodies with the *ſanies* of a mad Dog, Viper, Toad, or any other ſuch like venemous Creature, if ſo be that it be preſently wiped or waſhed clean away.

The force of Sorrel.

The force of Docks.

An Hiſtory.

Leaping into the Sea no certain remedy againſt Madneſs.

CHAP. XV.

What Cure muſt be uſed to ſuch as fear the Water, but yet are able to know themſelves in a Glaſs.

The force of Antimony againſt madneſs.

SUch as have not their animal faculty as yet overcome by the malignity of the raging venom, muſt have ſtrong purgations given them. Wherefore if in any caſe Antimony be uſeful, then is it in this, as that which cauſeth ſweats, looſeth the belly, and procures vomiting: For it is a part of extreme and dangerous madneſs to hope to overcome the cruel malignity of this poiſon already admitted into the bowels, by gentle purging Medicins. Aſſuredly, Such and ſo great danger is never overcome without danger. Baths alſo conduce, which may diſperſe and draw forth the

poiſon

poison by causing sweats. Also many and frequent Treacle-potions are good to retund the venom, and strengthen the bowels; also it will be fitting to give them Water and all other liquid things, which they so much abhor, in a cup with a cover. Always let such as are poisoned, or stung, or bitten by a mad Dog or other venemous Beast, keep themselves in some warm and light place, that the poison which by coldness is forced in, may be the readilier drawn out by the means of heat, and the spirits be recreated by the brightness of the air and therefore move from the center to the circumference of the body, and let the room be perfumed with sweet things. To eat very hot and salt things presently at the beginning, as Onions, Leeks, all spiced meats, and strong Wine not allayed, seem not to be besides reason; because such things by their spirituous heat hinder the diffusion of the poison over the body, and strengthen the filled entrails. There be some 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 be better to fill themselves with meat to satiety than otherwise, because the malignity of humours is increased by hunger, than which nothing can be more harmful to venemous wounds. Yet within a short while after, as within five or six days they must return to a mediocrity, and use all things temperate, boiled meats rather than roasted, and that in a decoction of opening things, so to move urin. Lastly, They must keep such a diet as melancholick persons ought to do; neither shall they let bloud, lest so the poison should be further drawn into the veins; but it is good that the Patients body be soluble from the very first. Let their drink be Wine indifferently allayed with Water, *Oxymel simplex*, or the Syrup of the juice of Citron with boiled Water; or else this following Julip: ℞ *Succi limonum, & malorum citri, an.* ℥ ß. *succ. granat. acid.* ℥ ij. *aquæ acetosæ, min. & ros. an.* ℥ j. *aq. font. coq. quantum sufficit, fiat Julep. ut artis est.* Sleep is to be avoided until the force of the poison be abated, for by sleep the humours flow back into the bowels. All things that resist poison must be given any way whatsoever, as Limons, Oranges, Angelica-roots, Gentian, Tormentil, Burnet, Vervain, *Cardous Benedictus*, Borage, Bugloss, and the like. Let all things that are afterwards set before the Patient, be meats of good juice, such as are Veal, Kid, Mutton, Partridge, Pullets, Capons, and the like.

Why sleep is hurtful to such as are bitten by a mad dog, and all such as are poisoned.

CHAP. XVI.

Of the biting of a Viper or Adder, and the symptoms and cure thereof.

THe remedies that were formerly mentioned against the bitings of mad Dogs, the same may be used against all venemous bites and stings, yet nevertheless each poison hath his peculiar antidote. Vipers or Adders (as we 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 body, unless it be hindred: gross and bloudy filth sweats out of the wound, little blisters arise round about it, as if it were burnt, the wound gnaws, and as it were feeds upon the flesh, great inflammation possesseth the Liver and the Guts, and the whole body becomes very dry, becoming of a pale or yellowish colour, with thirst unquenchable; the belly is griped by fits, a cholerick vomiting molesteth them, the Stomach is troubled with a hicketing, the Patients are taken with often swounings, with cold sweat, the fore-runner of death, unless you provide by fit Medicins for the noble parts, before the poison shall invade them. *Matthiolus* tells, that he saw a Country man, who as he was mowing a Meadow, by chance cut an Adder in two with his Sithe, which when he thought it was dead, he took the one half, whereon the head remained, without any 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) he put into his mouth, and sucked out the bloud and poison, and presently fell down dead.

The bites of Vipers how virulent.

The symptom

An History.

When as *Charles* the ninth was at *Montpelier*, I went into the shop of one *Farges* an Apothecary, who then made a solemn dispensation of Treacle, where not satisfying my self with the looking upon the Vipers that were there in a glass, ready for the composition, I thought to take one of them in my hands, but whilest 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 very end of my fore-finger, and bit me in the space between the nail and the flesh; whence presently there arose great pain, both by reason of the part endued with most exquisit sense, as also by the malignity of the poison: forthwith I exceeding straightly bound my finger above the wound, that so I might press forth the bloud and poison, lest they should diffuse themselves further over the body. I dissolved old Treacle in *Aqua vitæ*, wherein I dipped and moistned Cotton, and so put it to the wound, and within a few days I thorowly recovered by this onely Medicin. You may use in stead of Treacle, Mithridate and sundry other things, which by reason of their heat are powerful drawers, as a Quill roasted in hot Embers, Garlick and Leeks beaten and applied, Barley-flour tempered with Vinegar, Honey, and Goats-dung, and so applied like a pultis. Some think it sufficient forthwith to wash and foment the wound with Vinegar, Salt, and a little Honey. *Galen* writes, that the poison inflicted by the bite of a Viper, may be drawn forth by the applying to the wound the head of a Viper, but other-some apply the whole Viper beaten to mash.

An History.

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, because by biting he causeth bloud to drop out of all the passages of the wounded body; he is of a small body, of the bigness of a Viper, with eyes burning with a certain fiery brightness, and a most beautiful skin. The back of him (as *Avicen* writes) is spotted with many black spots, his neck little, and his tail very small: the part which he bites forthwith grows blackish, by reason of the extinction of the native heat, which is extinguished by such poison which is contrary thereto in its whole substance. Then follows a pain of the stomach and heart, these parts being touched with the pestiferous quality of the poison. These pains are seconded by vomiting, the orifice of the ventricle being relaxed by a *Diarrhœa*, the retentive faculty of all the parts of the belly being weakned, and the veins which are spread through the guts, not being able to retain the bloud contained in them. For the bloud is seen to flow out, as in streams, from the Nose, Mouth, Ears, Fundament, Privities, corners of the Eyes, roots of the Nails, and Gums, which putrefie, the Teeth falling out of them. Moreover there happens a difficulty of breathing, and stoppage of the urin, with a deadly convulsion.

Wonderful bleedings.

The Cure is forthwith to scarifie and burn the bitten part, or else to cut it quite off, if that it may be done without danger of life, and then to use powerfully drawing Antidotes.

The Figure of the Serpent Hæmorrhous.

CHAP. XVIII.

Of the Serpent called Seps.

The reason of the name, and description of the *Seps*.

THe Serpent *Seps* is so called, because it causeth the part which it bites, forthwith to putrefie by reason of the cruel malignity of its poison. It is not much unlike the *Hæmorrhous*, but that it curls or twines up the tail in divers circles. *Pausanias* writes that this Serpent is of an ash-colour, a broad head, small neck, big belly, writhen tail, and as he goes he runs aside like a Crab; but his skin is variegated and spotted with several colours, like to Tapistry. By the cruelty of his caustick and putrefying venom he burns the part which he hath bit, with most bitter pain; he causeth the shedding of the hairs, and as *Aetius* addeth, the wound at the first casteth forth manifest bloud, but within a little while after, stinking filth. The putrefied affected parts wax white, and the body all over becomes of the colour of that scurff which is termed *Alphos*, so that by the wickedness of this putrefactive poison, not onely the spirits are resolved, but also the whole body consumed, as by fire, a pestilent carbuncle, and other putrid tumors, arising from an hot and humid or suffocating constitution of the air. Now for the remedies, they must be such as are formerly prescribed against the bitings of a Viper.

The symptoms.

The Figure of the Serpent Seps.

CHAP. XIX.

Of the Basilisk, or Cockatrice.

The efficacy of the poison of the Basilisk

THe Basilisk far exceeds all kinds of Serpents in the cursitness of its poison. Therefore it is affirmed by *Nicander*, that into what place soever he comes, other venemous creatures do forthwith flie thence, for that none of them can so much as endure his hissing; for he is thought to kill all things even with this, and not with his biting and touch onely; besides, if any of them

them haſten to get any meat or drink, and perceive that the Baſilisk is not far from thence, he flies back, and neglects the getting of nouriſhment neceſſary for life. *Galen* writes, that the Baſilisk is a yellowiſh Serpent, with a ſharp head, and three riſings diſtinguiſhed with white ſpots, and riſing up in form of a Crown, by reaſon whereof he is ſtiled the King of Serpents. Certainly the violence of his poiſon in killing men is ſo great, that he is therefore thought to kill men and other creatures by his ſight only. *Solinus* affirms, that the body of a Baſilisk hath wondrous faculties: Wherefore the Inhabitants of *Pergamum*, in ancient times gave a mighty price for one to hang upon the Joiſts of the Temple of *Apollo*, ſo to drive away the Spiders and Birds, leſt they ſhould weave 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 happens not onely by eating their body, but alſo by devouring of the bodies of ſuch Beaſts as are killed by their bitings. 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 body, and ſlow, having a great head, which it ſcarce can carry, but that it lies always upon the ground, otherwiſe it would kill abundance of people, for it forthwith kills all that ſees the eyes thereof, the Baſilisk hath the ſame force; he is bred in the Province of *Cyrene*, of the length of ſome twelve fingers, with a white ſpot in his head, reſembling a Crown; he chaſeth away all ſorts of Serpents with his hiſs. Weaſels are the deſtruction of ſuch monſters: thus it pleaſed Nature that nothing ſhould be without its equal; they aſſail them in their dens, being eaſily known by the barrenneſs or conſumption of the ſoil. Theſe kill them alſo by their ſent, and they die, and the ſight of Nature is ended. Thus Nature to the magnanimous Lion, leſt there ſhould be nothing which he might fear, hath oppoſed the weak creature the Cock, by whoſe crowing onely he is terrified and put to flight. *Eraſiſtratus* writes, that a golden yellowneſs affects the bitten part of ſuch as are hurt by a Baſilisk, but a blackneſs and tumour poſſeſſeth the reſt of the body, all the fleſh of the muſcles within a while after falling away by piece-meal. An Antidote againſt this muſt be made of a dram of *Caſtoreum*, diſſolved in wine and drunken, or in the juice of poppy. But *Aetius* thinks it ſuperfluous to write remedies againſt the Baſilisk, when as the ſight and hearing onely kills ſuch as either ſee or hear her.

Lib. de Theriac.

Why the Baſilisk is thought to kill by his onely ſight.

Plin. lib. 8. c. 21.

The *Catablepas*.

Nothing in Nature without its equal.

Symptoms.

Cure.

The Figure of a Baſilisk.

CHAP. XX.

Of the Salamander.

THe Salamander kills not onely ſuch as it bites, by making a venemous impreſſion, but it alſo infects the Fruits and Herbs over which it creeps, with a ſpittle or groſs moiſture which ſweats out of all the body, 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 ſome late Writers, that ſome 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 infects all the Fruit with the qualities of cold and moiſt poiſon, wherein it yields not to Aconite.

The malignity of a Salamander.

Aetius writes, that ſuch as are infected with the poiſon of a Salamander, certain parts of their body grow livid, ſo that they fall away often, being putrefied. At the firſt there appear white ſpots, over the body, then red, afterwards black with putrefaction; and the falling away of the hairs. The Cure is to procure vomit, to looſe the belly with a Clyſter, and to give them Treacle and Mithridate in potions. *Avicen* preſcribes the ſame things againſt this kind of poiſon as againſt *Opium*, by reaſon of the cold nature of them both; the proper Antidote is Turpentine, *Styrax*, Nettle-ſeeds, and Cypreſs-leaves. *Dioſcorides* writes, that the Salamander is a kind of Lizard, dull, variegated, and which is falſly reputed, not to be burnt by fire. But *Pliny* ſaith ſhe is ſo cold, that ſhe extinguiſheth the fire by her touch onely, being laid upon hot Coals. On the contrary, *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 he, paſſeth through a burning flame and is not hurt, the flame dividing it ſelf, and giving her way, but if ſhe continue any time in the fire, the cold humour being conſumed in her, ſhe is burnt. Now the Salamander is black, variegated with yellow ſpots Star-faſhion.

The temper of her.

Symptoms.

The Cure.

Lib. 2. cap. 54.

How a Salamander may be ſaid to live in the fire.

The

The Figure of a Salamander.

CHAP. XXI.

Of the Torpedo.

The craft of the *Torpedo*.

His ſtupefying force.

THe *Torpedo* hath his name from the effect, by reaſon that by his touch and power the members become torpid and numb. In muddy ſhores it lives upon fiſh, which ſhe catcheth by craft. For lying in the mud, ſhe ſo ſtupefies thoſe that are nigh her, that ſhe eaſily preys upon them. She hath the ſame power over men, for ſhe ſends a numbneſs not onely into the arm of the Fiſher-man, but alſo over all his body, although his Fiſhers Pole be between them.

The Effigies of a Torpedo.

CHAP. XXII.

Of the bitings of Aſps.

Symptoms.

Curing.

An Hiſtory.

By what means Aſps may be made leſs hurtful. *Gal. lib. de Ther. ad Piſonem.*

Againſt the bites of what Serpents Treacle doth no good.

A certain remedy againſt the biting of Aſps.

THe wound which is made by an Aſp is very ſmall, as if a needle were thruſt into the part, and without any ſwelling. Theſe ſymptoms follow upon her bite, ſudden darkneſs clouds their eyes, much agitation in all their bodies, but gentle notwithſtanding; a moderate pain of the ſtomach troubles them, their fore-heads are continually troubled with convulſive twitchings, their cheeks tremble, and their eye-lids fall gently to reſt and ſleep; the bloud which flows from the wound is little, but black; death no longer deferred then the third part of a day, will take them away by convulſions, unleſs you make reſiſtance with fitting remedies. The male Aſp makes two wounds, the female four, as it alſo happens in the bitings of Vipers. Now for that the poiſon of Aſps congeals the bloud 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 poured into the wound; the Patient muſt be warmed by baths, frictions, walking and the like. When as the hurt part becometh purple, black, or green, it is a ſign that the native heat is extinct and ſuffocated by the malignity of the venom. Therefore then it is beſt to amputate the member, if the Patient be able to endure it, and there be nothing which may hinder. *Vigo* writes that he ſaw a Mountebank at *Florence*, who that he might ſell the more of his Antidotes, and at the better rate, let an Aſp to bite him by the finger, but he died thereof ſome four hours after. To the ſame purpoſe you may read *Matthiolus*, whereas he writes that thoſe Impoſtors or Mountebanks to cozen the better, and deceive 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 deadly poiſon; then they feed them meats formerly unuſual to them, ſo that by long keeping and care, and at length they bring it to paſs, that they put off a great part of their venemous Nature; neither being thus ſatisfied, they make them oftentimes to bite upon pieces of fleſh, that ſo they may caſt forth into them their venom which is contained in the membrane between their teeth and gums. Laſtly, they force them to bite, lick, and ſwallow down an aſtringent medicin, which they compoſe and carry about for the ſame purpoſe, that ſo they may obſtruct the paſſages by which the venom uſed to flow out, for thus at length their bites will be 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 remedy againſt all poiſonous bites. *Chriſtopher Andrew* in his Book called *Oicoiatria*, writes, that the Iſlands of *Spain* are every where full and ſtored with Serpents, Aſps, and all ſorts of venemous Beaſts, againſt whoſe bites they never obſerved or found any benefit in Treacle. But the efficacy of the following Antidote is ſo certain and excellent, and approved by ſo manifold experience, that in the confidence thereof, they will not be afraid to let themſelves be bitten by an Aſp. Now this Medicin is compoſed of the leaves of Mullet, Avens, and red Stock-gillyflowers in like quantity, which they boil in ſharp

ſharp Vinegar and the Urin of a ſound man, and therewith foment the wounded part. Yet if he have not taken nor uſed any thing of a good while after the wound, it will be better and more certain, if the Patient drink three ounces of this decoction faſting two hours before meat.

CHAP. XXIII.

Of the biting of a Snake.

I Have thought good in a true Hiſtory to deliver the virulent malignity of the bite of a Snake, and the remedies thereof. When as King *Charles* the nineth was at *Moulins*, Mouſieur *le Feure* the Kings Phyſician and I were called to cure the Cook of the Lady of *Caſtelphers*, who gathering Hops in a hedge to make a Sallet, was bit on the hand by a Snake that there lay hid, he putting his hand to his mouth, ſucked the wound to eaſe the pain by ſucking forth the venom; but his Tongue forthwith ſwelled ſo big, that he could not ſpeak his mind: beſides, his whole arm, even to his ſhoulder, was in like ſort much ſwelled, his pain was ſo vehement, that it hath made him ſwoun twice in my preſence, his face was wan and livid like to a dead body; and though I deſpaired of his recovery, yet not ſuffering him to be quite forſaken, I waſhed his mouth with Treacle diſſolved in white Wine, and gave him ſome thereof to drink, adding thereto ſome *Aqua Vitæ*. I opened his ſwollen arm with many and deep ſcarifications, eſpecially in the place where he was hurt I ſuffered the bloud 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, procuring ſweat, and making 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 he was freed from all his malign ſymptoms. Therefore I judged it onely remained for a perfect cure, that the wound ſhould be long kept open and waſhed with Treacle; neither was I deceived, for within a few days he was perfectly recovered.

An Hiſtory.

The Cure.

CHAP. XXIV.

Of the bitings of Toads.

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 body by the pores of the preſſed part. Moreover they caſt forth their venom by urin, ſpittle, and vomit upon herbs, but chiefly upon Straw-berries, the which they are reported greatly to affect. Hence many ſuddenly and ignorantly catch their deaths.

The bites of Toads how harmful.

I heard from a man of very good credit, that there were two Merchants not far from the City *Tholouſe*, who whileſt dinner was providing, walked into the Garden that belonged to the Inn, where they gathered ſome Sage leaves, and unwaſhed as they were, put them in their Wine. They had not as yet dined, when being taken with a ſudden *Vertigo*, the whole Inn ſeemed to run round, then loſing their ſight, they fell into a ſwoun, intermixed now and then with convulſions. But they ſtammered with their lips and tongues becoming black; a froward and horrid look, with continual vomiting and a cold ſweat, the fore-runner of death, which preſently ſeized upon them, their bodies becoming exceedingly much ſwollen. But the Juſtices of the place ſuſpecting that they were poiſoned, made the Inn-keeper and the Gueſts to be apprehended; being 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 they put Sage into their Wine. A Phyſician was asked the queſtion whether Sage might be poiſoned? he anſwered it might: but to come to the purpoſe, it muſt appear whether any venemous Creature hath poiſoned the Plant with her ſpittle or venemous ſanies. This which was lightly pronounced, and onely by conjecture, was by the eye found to be 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 urin, whereby you may underſtand how unwiſely they do, who devour herbs and fruits newly gathered without waſhing. Alſo we muſt take heed leſt falling aſleep in the fields, we lie not near the holes which Toads or other venemous beaſts of the ſame nature, have made their habitation. For thence a venemous or deadly air may be drawn into the Lungs. For the ſame cauſe we muſt abſtain from eating of Frogs in the Moneth of *May*, becauſe then they engender with Toads. Oxen in feeding ſometimes lick up ſmall Toads together with the Graſs, which preſently will breed their great harm, for thereupon the Oxen ſwell ſo big, they often burſt withall. Neither is the venom of Toads deadly onely being taken inwardly, but even ſprinkled upon the skin, unleſs they forthwith wipe the place, and waſh it with urin, water and ſalt. Such as are poiſoned by a Toad turn yellow, ſwell over all their bodies, are taken with an Aſthmatick difficulty of breathing, a *Vertigo*, Convulſion, Swouning, and laſtly by death it ſelf. Theſe ſo horrid ſymptoms are judged inherent in the poiſon of Toads, not onely by reaſon of the elementary qualities thereof, coldneſs and moiſture, which are chiefly predominant therein; but much rather by the occult property which is apt to putrefie the humours of that body whereto it ſhall happen. Therefore it will be convenient to procure vomit, eſpecially if the poiſon be taken by the mouth, to give Clyſters, and to weaken the ſtrength of the poiſon by hot and attenuating Antidotes, as Treacle and Mithridate diſſolved in good Wine; but in concluſion to digeſt it by Baths, Stoves, and much and great exerciſe. *Randeletius* in his Book *De Piſcibus*, affirms the ſame things of the curſed venom of Toads, as we have formerly delivered: yet that they ſeldom bite, but that they caſt forth either their urin, the which they gather in a great quantity in a large Bladder, or elſe their venemous ſpittle or breath, againſt ſuch as they meet withall or aſſail: beſides the herbs which are tainted by their poiſonous breath,

An Hiſtory.

The ſymptoms occaſioned by the poiſon of Toads.

May-Frogs.

The Cure.

Antidotes against the poison of Toads.

breath, but much more such as are sprinkled with their spittle or urin, are sufficient to kill such as eat them. The Antidotes are juice of Betony, Plantain, Mugwort, as also the bloud of Tortoises made with flour into Pills, and forthwith dissolved in Wine, and drunken. *Pliny* writes, that the hearts and spleens of Toads resist poison. The vulgar opinion is false, who think that the Toad-stone is found in their heads, which is good against poison.

CHAP. XXV.

Of the stinging of a Scorpion.

The description of a Scorpion. His Tail.

A Scorpion is a small creature with a round body, in form of an Egg, with many feet, and a long tail consisting of many joints, the last whereof is thicker, and a little longer than the rest, at the very end thereof is a sting it casts, in some two, hollow and replete with cold poison, the which by the sting, it casts into the obvious body; 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 sooty colour, they go aside, aside; and oft-times fasten themselves with their mouths and feet so fast to them, that they can scarce be plucked there-hence. There be

Winged Scorpions.

some who have wings like the wings of Locusts, wasting the Corn and all green things with their biting and burning. Such are unknown in *France*. These fly in divers Countries, like winged Ants. This is likely to be true by that which *Matthiolus* writes, That the Husband-men in *Castile* in *Spain*, in digging the Earth oft-times find a swarm of Scorpions, which betake themselves thither against Winter. *Pliny* writes, that Scorpions laid waste a certain part of *Ethiopia*, by chasing away the Inhabitants. The Ancients made divers kinds of Scorpions, according to their variety or difference of colours, some being yellow, others brown, reddish, ash-coloured, green, whitish, black, dusky; some have wings, and some are without. They are more or less deadly, according to the Countries they inhabit. In *Tuscany* and *Scythia* they are absolutely deadly, but at *Trent*,

Symptoms.

and in the Island *Pharos* their stinging is harmless. The place stung by a Scorpion presently begins to be inflamed, it waxeth red, grows hard, and swells, and the Patient is again pained; he is one while hot, another while cold; labour presently wearies him, and his pain is some whiles more and some whiles less; he sweats and shakes as if he had an Ague, his hair stands upright, paleness discolours his members, and he feels a pain, as if he were pricked with Needles over all his skin, wind flieth out backwards; he strives to vomit and go to stool, but doth nothing; he is molested

Lib. 2. cap. 44. & lib. 6. cap. 10.

with a continual Fever and swouning, which at length proves deadly, unless it be remedied. *Dioscorides* writes, that a Scorpion beaten and laid to the place where he is stung, is a remedy thereto; as also eaten roasted to the same purpose. It is an usual, but certain remedy to anoint the stung place with the oil of Scorpions. There be some who drop into the wound the milky juice of Figs, others apply Calamint beaten, other some use Barly-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 leaves of *Rue* beaten, and laid thereto. In like sort also the herb *Scorpioides*, which thence took its name, is convenient, as also a Briony-root boiled

Lib. 3. cap. 1.

and mixed with a little Sulphur and old Oil. *Dioscorides* affirms, Agarick in Powder, or taken in Wine, to be an Antidote against poisons; verily it is exceeding good against the stingings or bitings of Serpents. Yet the continual use of a Bath stands in stead of all these, as also sweat, and drinking Wine somewhat allaid. Now Scorpions may be chased away by a fumigation of Sulphur and Galbanum; also oil of Scorpions dropped into their holes, hinders their coming forth. Juice of Raddish doth the same. For they will never touch one that is besmeared with the juice of Raddish or Garlick, yea verily, they will not dare to come near him.

CHAP. XXVI.

Of the stingings of Bees, Wasps, &c.

Bees, Wasps, Hornets, and such like, cause great pain in the skin wounded by their stinging, by reason of the cursitness of the venom which they send into the body by the wound, yet are they seldom deadly, but yet if they set upon a man by multitudes, they may come to kill him. For thus they have sometimes been the death of Horses: Wherefore because such as are stung by these, by reason of the cruelty of pain, may think they are wounded by a more virulent and deadly Creature, I think it not amiss to set down what signs follow upon their stingings.

Symptoms. The Cure.

Great pain presently ariseth, which continueth, until the sting left in the part is taken forth, the part becomes red and swollen, and there riseth a push or little blister. The Cure is, forthwith to suck the wound very hard, and thereby to draw forth the stings, which if they cannot thus be gotten out, the place, if nothing hinder, is to be cut, or else temper Ashes with Leven or Oil, and so apply them: the part also may be very conveniently put into hot Water, and there fomented for an hours space, and at length washed in Sea water. Cresses beaten and applied, asswage the pain and discuss the humour causing the tumor. Ox dung macerated in Oil and Vinegar, and applied hot, doth the same. There are some who apply to the part the same Creatures beaten, as we formerly said of Scorpions; Beans chawed and laid to the part asswage pain. Vinegar, Honey, 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 milky juice of unripe Figs incorporated with Honey, is judged very effectual, but it is much the better, mixed with Treacle. Wasps will not sting nor bite such as anoint their bodies with the juice of Mallows mixed with Oil. They may be quickly chased away with the fume of Brimstone and such like things. A Wasp is said, if she find

find 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 hairy Worms, which are commonly called Bear-worms, eſpecially thoſe which breed about a Pine-tree, cauſe great itching, redneſs and ſwelling in the part which they bite, touch, or grate upon very hard. A remedy hereof is Onions beaten with Vinegar, and the reſt of the things formerly mentioned. The bites of Bear-worms.

CHAP. XXVII.

Of the bite of a Spider.

SPiders weave Webs with various art, yet in theſe they always make a lurking hole to lie in wait to catch the intrapped Flies, and ſo to prey upon them. There are many ſorts of Spiders, one is termed *Rhagium*, round and like a Black-berry, whence it taketh the name; it hath a very ſmall mouth under the midſt of the belly, 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, becauſe ſhe 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 body thereof is black, and hath white ſpots or ſtreaks running towards the back. The fourth kind may be called *Veſparium*, in other things reſembling a Waſp, but that it wants the wings; of a reddiſh colour and living onely on herbs. The Ancients have thought their bitings to be venemous. Now their poiſon is therefore thought to be cold, becauſe the ſymptoms thence ariſing are, wind in the belly, refrigerations of the extreme parts of the body, numneſs in the bitten part, with ſenſe of cold and ſhaking. The wound muſt forthwith be waſhed with very hot Vinegar, 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 than Treacle and Mithridate. Differences of Spiders.

CHAP. XXVIII.

Of Cantharides *and* Bupreſtes.

Cantharides ſhine as it were with a golden colour, acceptable to the eye, by reaſon of the commixture of a blewiſh or greeniſh colour therewith, yet their ſmell is ungrateful. They are hot and dry in the fourth degree, and ſo cauſtick, corroſive and venemous, not onely by reaſon of their cauſtick quality, but becauſe of a ſecret antipathy which they naturally have againſt the urinary parts; which effects they produce not onely if they be taken by the mouth into the body, but even applied outwardly to raiſe bliſters. Such as have taken them inwardly, have the taſte of Pitch, or ſomething like *Cedria*, or Roſin of Cedars in their mouths; it is likely that this taſte proceeds from the humours diſſolved by the putredinous heat in the ſtomach, guts, and liver, and the vapours that there-hence ariſe; for taken inwardly they gnaw, exulcerate and burn all parts from the mouth even to the belly, whence enſueth a bloudy flux, excrements flowing out, which reſemble the waſhings of new killed fleſh. Then follows a burning Fever, *Vertigo*, Madneſs, Reſtleſneſs, the Brain being diſturbed by the plenty of vapors lifted up from the corroded and burnt parts and humours, which therefore when as they appear, you may know the affect is uncurable. In the parts appointed for the receiving and conveyance of the urin they cauſe a burning inflammation, excoriation, ſtrong and continual erection of the Yard, whence enſues a bloudy and painful ſtrangury, in ſtead of which there oft-times happens or ſucceeds an *Iſchury*, or ſtoppage of the water, whence a gangrene and mortification of the part, and ſo in concluſion of the whole body beſides. When as *Cantharides* are taken inwardly, the remedy is vomiting, drinking of Cows-milk to correct the heat and drineſs, good alſo to mitigate the ulcers, and ſtay the dyſentery; it is good alſo to inject it into the guts by Clyſter. In ſtead thereof Sallet-oil or oil of ſweet Almonds is convenient to retund the acrimony of the poyſon faſtned to the ſides of the ſtomach. The reſt and whole cure of this poiſon you may learn by the following Hiſtory. A certain Whore, the better to enjoy the company of a young Abbot who loved her, entertained him with a banquet, and ſprinkled divers of their Cakes with the powder of *Cantharides*, to incite him the more to Venery. The next day, when as the Abbot caſt forth pure bloud at his Fundament and Yard which ſtood very ſtiff, he called ſome Phyſicians, who preſently by the fore-mentioned ſymptoms, which were all very apparent in him, underſtood that he had *Cantharides* given him: wherefore they purged him upwards with Vomits, and downwards by Clyſters made with French-barley, Rice, a decoction of Mallows, ſeeds of Line and Fœnugreek, Oil of Lillies, Goats ſuet: then preſently after they gave him a little Treacle with a good quantity of Conſerve of Violets, which might draw the poiſon outwards, they gave him Milk to drink, and cauſed him to uſe injections into the urinary paſſage and guts made of refrigerating things, as the juice of Lettuce, Purſlain, Cucumers, 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 Barley-water, or the common Piſan; they let him feed on Veal, Kid, and Pork boiled with Lettuce, Purſlain, Barley and Violet leaves, the which by their humidity might relax the belly, and by their toughneſs lenifie the roughneſs of aſperity; they applied alſo refrigerating things to the Loins, Share, and *Perinæum* to aſſwage the heat of the urin. 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 endeavours were in vain, for the Abbot died, not being deſtitute of remedies conveniently preſcribed, but overcome by the contumacious malignity of the poiſon. The Phyſicians pains had far better ſucceſs in a certain Gentlewoman againſt this kind of affect; her

The deſcription of *Cantharides*.

Enemies to the bladder, Symptoms.

An Hiſtory.

The Cure.

An Hiſtory.

her whole face was deformed with red, fiery and filthy puſtles, ſo that all ſhunned her company as if ſhe had been troubled with a Leproſie, and were ready to forbid her the ſociety of men; ſhe came to *Paris*, and calling for *Hollerius* and *Grealnus* Phyſicians, my ſelf and *Cabalus* being Surgeons, ſhe made a grievous complaint, and beſought us earneſtly for ſome remedy againſt ſo great a deformity of her face; having diligently conſidered her caſe, we pronounced her free from a Leproſie, but we judged it fit to apply to her whole face a veſicatory of *Cantharides*, three or four hours after the application whereof, the Medicin being come to work its effect, her bladder began to burn exceedingly, and the neck of her womb to ſwell with gripings, continual vomitings, making of water and ſcouring, a troubleſome agitation of the body and members, a burning and abſolutely fiery Fever. I forthwith called the Phyſicians, it was decreed that ſhe ſhould drink Wine plentifully, and that it ſhould be injected by the fundament into the guts, and by the urinary paſſage into the bladder and the neck of the womb, and that ſhe ſhould keep her ſelf, until the pain were mitigated, in a warm Bath made of the decoction of Line-ſeeds, the roots and leaves of Mallows, Marſh-mallows, Violets, Henbane, Purſlain, and Lettuce; and her loins and genitals ſhould be anointed with *unguentum roſatum* and *pulcon* 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 deformity wherewith ſhe was formerly troubled, vaniſhed away for ever, ſo that within a while after ſhe was married, and had many children, and is yet living in perfect health.

Cantharides applied to the head, ulcerate the bladder.

A remedy againſt Leprous puſtles.

Bupreſtes alſo are of the kind of *Cantharides*, being like unto them in ſhape and faculty. If an Ox or Sheep or any other Creature ſhall in feeding devour one of them, he ſhall 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 taking *Cantharides*; and over and beſides, both his ſtomach and his whole belly ſhall be wonderfully puffed up, as if he had a Dropſie. It is probable that this inflation like a Tympany happeneth by humours diffuſed and reſolved into vapours by the fiery acrimony of the venom. They are to be cured after the ſame manner as ſuch as have drunk *Cantharides*. Laſtly, As in all other poiſons which are taken into the body, ſo alſo here, if the poiſon taken by the mouth be thought as yet to be in the ſtomach, you muſt then procure vomit. If it be gotten into the guts, then muſt it be drawn away by Clyſters. If diffuſed over all the body, 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 muddy ſtinking ditches, for thoſe are leſs hurtful which reſide in clear and pure waters. Wherefore, before they are to be uſed in caſes of Phyſick, they muſt be kept for ſome days ſpace in clean water, that ſo they may purge themſelves; otherwiſe they may chance to leave ulcers hard to cure in the places whereto they ſhall be applied, and the rather, if they be violently plucked off, becauſe they by that means leave their teeth faſtned in the part. Now he which by chance hath ſwallowed a Horſe-leech, muſt be asked in what part he feeleth her, that is, the ſenſe of her ſucking: For if ſhe ſtick in the top of the throat or gullet, or in the midſt thereof, the part ſhall be often waſhed with muſtard diſſolved in vinegar. If ſhe be near the orifice of the ventricle, it is fit that the Patient by little and little ſwallow down Oil with a little Vinegar. But if ſhe faſten to the ſtomach, or the bottom of the ventricle, the Patient, by the plucking off the part, ſhall perceive a certain ſenſe of ſucking, the Patient will ſpit bloud, and will for fear become Melancholick. To force her thence, he ſhall drink warm Water with Oil; but if ſhe cannot ſo be looſed, then ſhall you mix aloes therewith, or ſomething endued with the like bitterneſs, for ſhe will by that means leave her hold and ſo be caſt forth by vomit. You may perceive this by ſuch as are applied to the skin, on the external parts; for by the aſperſion of bitter things, whether they be full or empty, they will forſake their hold. Then ſhall the Patient take aſtringent things which may ſtop the bloud flowing forth of the bitten part, ſuch is Conſerve of Roſes, with *Terra ſigillata*, Bole-Armenick, and other more aſtringent things, if need ſo require. For if they ſhall adhere to ſome greater branch of ſome Vein or Artery, it will be more difficult to ſtop the flowing bloud.

Divers remedies according to the diverſity of the parts.

But for that not the Earth onely, but the Sea alſo produceth venemous Creatures, we will in like ſort treat of them, as we have already done of the other, beginning with the Lampron.

CHAP. XXX.

Of the Lampron.

The deſcription of the Lampron.

THe *Lampron*, called in Latin *Muræna*, is a Sea-fiſh, ſomething in ſhape reſembling a Lamprey, but ſhe is bigger and thicker, and hath a larger mouth, with teeth long, ſharp, and bending inwards, ſhe is of a dusky colour, diſtinguiſhed with whitiſh ſpots, and ſome two cubits length. The Ancients had them in great eſteem, becauſe they yield good nouriſhment, and may be kept long alive in Pools or Ponds, and ſo taken as the owners pleaſe, to ſerve their Table, as it is ſufficiently known by the Hiſtory of the *Roman Craſſus*. She by her biting induceth the ſame ſymptoms as the Viper, and it may be helped by the ſame means. Verily the Lampron hath ſuch familiarity with the Viper, that leaving her natural element the Sea, ſhe leapeth aſhore, 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.

CHAP. XXXI.

Of the Draco marinus, *or sea-Dragon.*

THe sea-Dragon, called by the French *vive*, for his vivacity (and by the English a *Viver*, or as some say, a *Qua-viver*) because being taken in fishing, and drawn out of the sea, she is said long to survive. Her pricks are poisonous, but chiefly those that are at the edges of her gills. Which is the reason that Cooks cut off their heads before they serve them up to the table; and at *Roven* the fishermen lay them not upon their stalls to sell before they have cut off their head. The wounded part of such as are hurt, pains them much with inflammation, a feaver, swouning, gangrene and deadly mortification, unless it be quickly withstood. Not very long ago the wife of *Mounsieur Fromaget*, Secretary 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 increase, being made more wary by the mischance of her neighbour the wife of *Mounsieur Bargelonne*, Lieutenant particular in the Chastelet of *Paris*, who died not long before by the like accident being neglected, sent for me; I understanding the cause of her disease, laid to her pained finger and her whole hand, besides a pultis made of a great Onion rosted under the coals, leaven, and a little treacle. The next day I wished her to dip her whole hand into warm water, so to draw forth the poyson, then I divided the skin about it with much scarification but only superficiarily; to the gashes I applied Leeches, which by sucking drawing a sufficient quantity 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 days she was perfectly well. *Dioscorides* writes, that this fish divided in the midst, and applied to the wound, will cure it.

Symptoms.

An history.

The cure.

CHAP. XXXII.

Of the Pastinaca marina, *or Sting-Ray, which some call the* Fierce-claw.

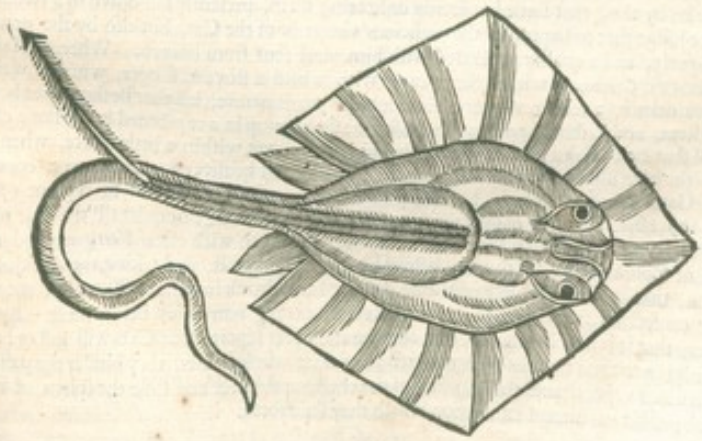
SUch as are stung by a Sting-Ray (as *Aetius* hath written) the place of the wound doth manifestly appear; there ensues thereon lasting pain and the numness of the whole body. And seeing that it hath a sharp and firm sting, whereby the nerves by the deepness of the stroke may be wounded, it so happpens that some die forthwith, their whole bodies suffering convulsions. Moreover, it will kill even the very trees into whose roots it is fastned. Yet *Pliny* affirms, that it is good against the pain of the teeth, if the gums be scarified therewith, yea, and it being made into powder with white Hellebore, or of it self, will cause teeth to fall out without any pain, or any violence offered to them. This fish is good meat, the head and tail excepted; some of them have two stings, other-some but one; these stings are sharp like a saw with the teeth turning towards their heads. *Oppianus* writes, that their stings are more poysonous than the Persians arrows, for the force of the poyson remaineth, the fish being dead; which will kill not only living creatures, but plants also. Fishermen, when they catch this fish, presently spoil him of his sting, lest they should be hurt therewith. But if by chance they be hurt therewith, then take they forth his liver, and lay it to the wound; furthermore, the fish being burnt and made into powder, is the true Antidote of his wound. The Sting-Ray lives in muddy places near the shore, upon the fishes that he hunteth and catcheth with his sting, having the teeth thereof turned towards his head for the same purpose. He is not unlike a Ray, and I have here given you his figure.

The symptoms.

Lib. 9. cap. 48.

The virulency of her sting.

The figure of a Sting-Ray.



CHAP. XXXIII.

Of the Lepus Marinus, *or Sea-hare.*

The description of the Sea-hare.

Pliny calls 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 poysonous in the judgment of the Ancients, wherefore it is not amiss to set down the description of it, lest we might eat it at unawares, too earnestly view it, or smell thereto, as also that we may use it against the poyson thereof; it is an inhabitant not only of the sea, but also of lakes of sea-water, especially such as are muddy; it is of the same colour as the hair of the land-hare is, it hath a whole in the head, out of which he putteth a certain piece of flesh, and plucks it back again when as he is seen, *Paulus*, *Aetius*, *Pliny*, *Galen* and *Nicander* are of one opinion, and agree in this, that if a woman big with child do too earnestly look upon one, she will vomit, and presently after abort. They which have drunk this poyson, saith *Dioscorides*, are troubled with pain in the belly, and their urine is stopped. If they do make water, then is it bloody; they run down with stinking sweat, which smells of fish; a cholerick vomiting sometimes mixed with blood ensues thereon.

The earnest beholding of a Sea-hare will cause abortion.

The symptoms.

Aetius writes, that all their bodies turn yellow, their faces swell, and their feet, but chiefly their genital member, which is the cause they cannot make water freely. *Galen* writes that it is the property of the Sea-hare to exulcerate the lungs. Their Antidote is Asses-milk, muskadine, or honied wine continually drunken, or a decoction of the roots and leaves of 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 Antidote.

The figure of a Sea-hare.

CHAP. XXXIV.

Of the Poyson of Cats.

A Cats hair most subject to choak.

NOt only the brain of a Cat, being eaten, is poysonous and deadly to man, but also their hair, their breath, yea and their very presence to some prove deadly. For although any hair devoured unawares, may be enough to choak one, by stopping the instruments of respiration; yet the hairs of a Cat by a certain occult property, are judged most dangerous in this case: besides also, their breath is infected with a certain hurtful malignity. For *Matthiolus* saith, that he knew some, who being so delighted with Cats, that they would 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 very sight of their eyes is hurtful, which appears by this, that some but seeing or hearing them, presently fall down in a swound; yet I would not judge that to happen by the malicious virulency of the Cat, but also by the peculiar nature of the party, and a quality generated with him, and sent from heaven. When as, saith *Matthiolus*, a certain *German* in winter-time, came with us into a stove to supper, whereas were divers of our acquaintance, a certain woman, knowing this mans nature, lest that he should see her kitling which she kept, and so should go away in chase, she shut her up in a cup-board in the same chamber: But for all that he did not see her, neither heard her cry, yet within a little space, when he had drawn in the air, infected with the breath of the Cat, that quality of temperament, contrary, or enemy to Cats, being provoked, he began to sweat, to look pale, and to cry out (all of us admiring it) *Here lies a Cat in some corner or other*; neither could he be quiet till the Cat was taken away. But such as have eaten the brains of a Cat, are taken with often *Vertigoes*, and now and then become foolish and mad: they are helped by procuring vomit, and taking the Antidote against this poyson, that is, half a scruple of Musk, dissolved and drunk in wine. There be some who prescribe the confection *Diamoscum* to be taken every 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 suliginous vapors, and the motion of the chest, and infect and stifle 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 history.

A wonderful antipathy between a man and a Cat.

The Antidote against the brains of a Cat.

Cats dangerous for children.

CHAP.

CHAP. XXXV.

Of certain Poysonous Plants.

HAving described the poysons that come from living creatures, I come to speak of such as are from Plants, beginning with the *Sardonian* herb, which is also also called *Apium risus*: this is a kind 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 have eaten thereof, and by a certain distention of the nerves, contracts the cheek, so that it makes 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. *Apium risus.*

His Antidote

The juice, fruit, and substance of *Napellus* taken inwardly, killeth a man the same day, or at the farthest in three days: yea and such as escape the deadly force thereof by the speedy and convenient use of Antidotes, fall into an hectick feaver, or consumption, and become subject to the falling-sickness, as *Avicen* affirmeth. And hence it is, that barbarous People poyson their arrows therewith: For the lips are forthwith inflamed, and the tongue so swells, that by reason thereof, it cannot be contained in the mouth, but hangs out with great horror; their eys are inflamed, and stand forth of their head, and they are troubled with a *Vertigo* and swounding; they become so weak that they cannot stir their legs, they are swoln and puffed in their bodies, the violence of poyson is so great. The Antidote thereof is a certain little creature like a * Mouse, which is bred, and lives on the root of *Napellus*, being 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 anoint the body also with oil of Scorpions. *Napellus*, or Monks-hood.

* Our Author deceived by the *Arabians*, who (it may be) mistook the Greek word μῦς and instead thereof read μυῖα for a Flie, a Mouse: for there is no Mouse to be found, but whole swarms of Flies, which feed thereon, you may find the description of an Antidote made with them in *Labels Strip. advers. Pag.* 303.

Doricinum and *Solanum Manicum*, or deadly Night-shade, are not much different in their mortal symptoms or effects. *Doricinum* being drunk, resembleth milk in taste, it causeth continual hicketting, it troubleth the tongue with the weight of the humor, it causeth blood to be cast forth of the mouth, and certain mucous matter out of the belly, like that which cometh away in the bloudy flux. A remedy hereto are all shell-fishes, as well crude as rosted, also Sea-Lobsters and Crabs, as the broth or liquor wherein they are boyled, being 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 quantity causes a distraction or alienation of the mind for three days, but four times so much kills. The remedies are the same as these prescribed against *Doricinum*. *Doricinum* and *Solanum Manicum*, or deadly Night-shade.

The symptoms.

Hen-bane drunken, or otherwise taken inwardly by the mouth, causeth an alienation of the mind of like drunkenness; this also is accompanied with an agitation of the body, and exsolution of the spirits like swounding. But amongst others, this is a notable symptom, that the patients so dote, that they think themselves to be whipped: whence their voice becomes so various, that sometimes they bray like an Ass or Mule, neigh like an Horse, as *Avicen* writes. The Antidote is Pistick nuts eaten in great plenty, treacle also and mithridate dissolved in sack, also wormwood, *rue* and milk. Hen-bane.

The Antidote.

Of mushrooms, some are deadly and hurtful of their own kind and nature, as those, which broken presently become of divers colous, and putrefie: (such, as *Avicen* saith, those are which be found of a grayish or blewish colour) others though not hurtful in quality, yet eaten in greater measure than is fitting, become deadly; for seeing by nature they are very cold and moist, and consequently abound with no small viscosity, as the excrementitious phlegm of the earth or trees whereon they grow, they suffocate and extinguish the heat of the body, as overcome by their quantity, and strangle as if one were hanged, and lastly kill. Verily I cannot chuse, but pitty Gourmondizers, who though they know that Mushrooms are the seminary and gate of death, yet do they with a great deal of do, most greedily devour them; I say, pitying 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 Mushrooms may be eaten without danger, if that they be first boyled with wild pears: but if you have no wild pears, you may supply that defect with others which are the most harsh, either newly gathered, or dried in the Sun. The leaves, as also the bark of the same tree, are good, especially of the wild; for pears are their Antidote: yet *Conciliator* gives another, to wit, garlick eaten crude; whereunto in like sort vinegar may be 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 Mushrooms, as it is delivered by *Galen*. Mushrooms.

Their Antidote.

Ephemerum, which some call *Colchicum* or *Bulbus silvestris*, that is, medow saffron, being taken inwardly, causeth an itching over all the body, no otherwise than those that are nettled, or rubbed with the juice of a Squill. Inwardly they feel gnawings, their stomach is troubled with a great heaviness, and in the disease increasing, there are strakes of blood mixed with the excrements. The Antidote thereof is womans milk, Asses or Cows-milk drunken warm, and in a large quantity. *In* 5. *Epidem.* *Colchicum*, or Medow-saffron.

The Antidotes

Mandrag taken in great quantity, either the root or fruit causeth great sleepiness, sadness, resolution and languishing of the body, so that after many scritches and gripings, the patient falls asleep in the same posture that he was in, just as if he was in a Lethargy. Wherefore in times past they gave Mandrag to such as were to be dismembred. The apples, when as they are ripe, and their seeds taken forth, may be safely eaten, for being green and with their seeds in them, they are deadly. For their ariseth an intolerable heat, which burns the whole surface of the body, the tongue and mouth wax dry, by reason whereof they gape continually, so take in the cold air; and in which case Mandrag.

The cure. case unless they be presently helped, they die with convulsions. But they may easily be helped, if they shall presently drink such things as are convenient therefore. Amongst which, in *Conciliators* opinion, excel raddishseeds eaten with salt and bread for the space of three days. Sneesing shall be procured, if the former remedy do not quickly refresh them, and a decoction of Coriander or Penny-royal in fair water shall be given them to drink warm.

Opium. The ungrateful taste of the juice of black poppy, which is termed *Opium*, as also of Mandrag, easily hinders them from being put into meat or drink, but that they may be discerned, and chiefly
Why not used in poysonings. for that neither of them can kill, unless they be taken in a good quantity. But because there is danger, lest they be given in greater quantity than is fitting by the ignorance of Physicians, or Apothecaries, you may by these signs find the error.

The symptoms. There ensues heavy sleep, with a vehement itching, so that the patient oft-times is forced thereby to cast off his dull sleep wherein he lay, yet he keeps his eye-lids shut being unable to open them. By this agitation there flows out sweat, which smells of *opium*, the body waxeth pale, the lips burn, the jawbone is relaxed, they breath little and seldom. When as their eyes wax livid, unless they be drawn aside, and that they are depressed from their orb, we must know that death is at hand. The remedy against this is two drams of the powder of *Castoreum* given in wine.

Hemlock. Hemlock drunken, causeth *Vertigoes*, troubleth the mind, so that the patients may be taken for mad
The symptoms. men; it darkneth the sight, causeth hicketting, and benums the extreme parts, and lastly strangles with convulsions, by suppressing or stopping the breath of the Artery. Whereof at the first, as in other poysons, you must endeavour to expel it by vomit; then inject clysters, to expel that which is got into the guts; then use wine without mixture, which is very powerful in this case. *Peter Apponensis*
The Antidote. things the Bezoar or Antidote thereof, to be a potion of two drams of Treacle, with a decoction of *Dictamnus* or *Gentian* in wine. He which further desires to inform himself of the effects of Hemlock,
In lib. 6. Dioscor. let him read *Matthiolus* his commentary upon *Dioscorides*, where he treats of the same subject.

Aconitum. *Aconitum* called of *Aconis* a town of the *Periendines*, whereas it plentifully grows. According to *Matthiolus*, it kills Wolves, Foxes, Dogs, Cats, Swine, Panthers, Leopards, and all wild beasts, mixed with flesh, and so devoured by them, but it kills mice by only smelling thereto. Scorpions, if touched by the root of Aconite, grow numb and torpid, and so die thereof; arrows or darts dipped therein, make incurable wounds. Those who have drunk Aconite, their tongue forthwith waxeth sweet with a certain astriction, which within a while turneth to bitterness; it causeth a *Vertigo*, and shedding of tears, and a heavines or straitness of the chest and parts about the heart; it makes them
* *Lib. 27. cap. 2.* break wind downwards, and makes all the body to tremble. *Pliny* attributes so great celerity and violence to this poyson, that if the genitals of female creatures be touched therewith, it will kill the same day; there is no presenter remedy than speedy vomiting after the poyson is taken. But *Con-*
Aconite good against the poison of Scorpions. *ciliator* thinks *Aristolochia* to be the Antidote thereof. Yet some have made it useful for man by experimenting it against the stinging of Scorpions, being given warm in wine; for it is of such a nature that it killeth the party unless it find something in him to kill, for then it strives therewith as if it had found an adversary: But this fight is only when as it finds poyson in the body; and this is marvelous that both the poysons being of their own nature deadly, should die together, that man may by that means live. There are divers sorts thereof, one whereof hath a flower like an helmet,
The differences. as if it were armed to mans destruction; but the other here delineated hath leaves like to sows-bread or a cucumber, and a root like the tail of a Scorpion.

The figure of a certain kind of Aconite.

The Yew. Trees also are not without poyson, as the Yew and Walnut tree may witness; Cattel if they feed on the leaves of Yew, are killed therewith. * But men, if they sleep under it, or sit under the shadow thereof, are hurt therewith, and oft-times die thereof. But if they eat it, they are taken with a bloudy flux, and a coldness over all their bodies, and a kind of strangling or stoppage of their breath. All which things the Yew causeth, not so much by an elementary and cold quality, as by a certain occult malignity, whereby it corrupteth the humors and shaveth the guts. The
The Antidote. same things are good against this, as we have set down against Hemlock; *Nicander* affirms, that good wine being drunken, is a remedy thereto.
The Walnut tree There is also a malignity in a Walnut-tree, which *Grevinus* affirms that he found by experience, whilst he unawares sate under one, and slept there in the midst of Summer; For waking, he had a sense of cold over all his body, a heavines of his head, and pain that lasted six days. The remedies are the same as against the Yew.

* This is true in some countries, as in *Provence*, *Italy*, *Greece*, &c. but it is not so here with us in *England*, as both *Lobel* and daily experience can testifie.

CHAP.

CHAP. XXXVI.

Of Bezoar, *and Bezoartick medicines.*

FOr that we have made mention of *Bezoar*, in treating of the remedies of poysons, I judge I shall not do amiss, if I shall explain, what the word means, and the reason thereof. Poyson absolutely taken is that which kills by a certain specifick antipathy contrary to our nature. So an Antidote or Counter-poyson 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 only with the Arabians and Persians, because 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 history of the Spices and *Simples* of the East-Indies. In *Persia* (saith he) and a certain part of *India* is a certain kind of Goat called *Pazain* (wherefore in proper speaking, the stone should be termed *Pazar* of the word *Pazain*, that signifies a Goat, but we corruptly term it *Bezar* or *Bezoar*) the colour of this beast is commonly reddish, the height thereof indifferent, in whose stomach concretes the stone called *Bezoar*; it grows by little and little about a straw or some such like substance in scales like to the scales of an onion, so that when as the first scale is taken off, the next appears more smooth and shining as you still take them away, the which amongst others, is the sign of good *Bezoar* and not adulterate. This stone is found in sundry shapes, but commonly it resembles an Acorn or Date-stone; it is sometimes of a sanguin colour, and otherwhiles of a hony-like or yellowish colour, but most frequently of a blackish or dark green, resembling the colour of mad apples, or else of a Civet-Cat. This stone hath no heart or kernel in the midst, but powder in the cavity thereof, which is also of the same faculty. Now this stone is light and not very hard, but so that it may easily be scraped or rasped like Alablaster, so that it will dissolve, being long macerated in water; at first it was common amongst us, and of no very great price, because 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 Country, that no body should sell a Goat to the stranger-Merchants, unless he 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 many counterfeits brought hither) the first is already declared; the other is, it may be blown up by the breath, like an Oxes hide; for if the wind break through, and do not stay in the density thereof, it is accounted counterfeit. They use it induced thereto by our example, not only against poysons, but also against the bites of venemous beasts, The richer sort of the Countrey purge twice a year, to wit, in *March* and *September*; and then, five days together they take the powder of this stone macerated in Rose-water, the weight of ten grains at a time: for by this remedy they think their youth is preserved, as also the strength of their members. There be some who take the weight of thirty Grains; yet the more wary exceed not twelve grains. The same Author addeth that he useth it with very good success in inveterate melancholick diseases, as the itch, scab, tetters and leprosie; therefore by the same reason it may well be given against a quartane feaver. Besides he affirmeth for certain that the powder contained in the midst of the stone, put upon the bites of venemous beasts, presently freeth the patient from the danger of the poyson, as also applied to the pestilent Carbuncles, when they are opened, it draws forth the venom. But because the small pox and meazles are familiar in the Indies, and oftentimes dangerous, it is there given with good success, two grains each day in Rose-water. *Matthiolus* subscribeth to this opinion of *Garcis*, witnessing that he hath found it by frequent experience that this stone by much exceeds not onely other *simple* medicines of this kind, but also such as are termed *theriacalia*, and what other Antidotes soever, hereto also consents *Abdanalaraeb*; We (saith he) have seen the stone which they call *Bezahar*, with the sons of *Almarima* the observer of the Law of the God; with which stone he bought a stately, and almost princely house at *Cordoba*.

What poyson is.

A sign of true Bezoar.

The use of Bezoar.

Lib. 5. in Dioscor. cap. 73.

Some years ago, a certain Gentleman who had one of these stones which he brought out of *Spain*, bragged before King *Charles* then being at *Clermont* in *Auvern*, of the most certain efficacy of this stone against all manner of poysons. Then the King asked of me, whether there were any Antidote which was equally and in like manner prevalent against all poysons? I answered, that nature could not admit it; for neither have all poysons the like effects, neither do they arise from one cause; for some work from an occult and specifick property of their whole nature, others from some elementary quality which is predominant. Wherefore each must be withstood with its proper and contrary Antidote; as to the hot, that which is cold, and to that which assails by an occult propriety of form, another which by the same force may oppugn it, and that it was an easie matter to make trial hereof on such as were condemned to be hanged. The motion pleased the King, there was a Cook brought by the Jaylor who was to have been hanged within a while after for stealing two silver dishes out of his masters house. Yet the King desired first to know of him, whether he would take the poyson on this condition, that if the Antidote which was predicated to have singular power against all manner of poysons, which should be presently given him after the Poyson, should free him from death, that then he should have his life saved. The Cook answered chearfully, that he was willing to undergo the hazard, yea, and greater matters, not only to save his life, but to shun the infamy of the death he was like to be adjudged to: Therefore he then had poyson given him by the Apothecary that then waited, and presently after the poyson, some of the *Bedezahar* brought from Spain, which being taken down, within a while after he began to vomit, and to avoid much by stool with grievous torments, and to cry out that his inward parts were burnt with fire. Wherefore being thirsty, and desiring water, they gave it him; an hour after, with the good leave of the Jaylor, I was admitted to him; I find him on the

An history.

No one thing can be an Antidote against all poysons.

ground going like a beast upon hands and feet, with his tongue thrust forth of his mouth, his eyes fiery, 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 he died in great torment and exclamation, the seventh hour from the time that he took the poyson being scarcely passed. I opened his body in the presence of the Jaylor and four others, and I found the bottom of his stomach black and dry, as if it had been burnt with a cautery; whereby I understood he had *sublimate* given him; whose force the Spanish *Bedezahar* could not repress, wherefore the King commanded to burn it.

The caustick force of *sublimate*.

CHAP. XXXVII.

Of Mineral Poysons.

Minerals or metals are either so taken forth of the bowels of the earth, or else from fornaces. Of these many are poysonous, as arsenick, *sublimate*, *plaster*, cerus, litharge, verdegrease, orpiment, filings of Iron, brass, the loud-stone, lime and the like. Such as have taken *sublimate*, the tongue and jaws become straitned and rough, as if they had drunk the juice of unripe *services*: you cannot amend this asperity with lenitive gargarisms but with labour and time; for as soon as it descends into the stomach, it sticketh to it. Therefore presently after it frets and exulcerates; it causeth unquenchable thirst, and unexplicable torments; the tongue is swoln, the heart faints, the urine is suppresst, the cheft can scarce perform the office of breathing, the belly is griped, and so great pains happen to other extreme parts, that unless they be helped, patient will die; for presently will grow upon them, unless it be speedily hindred, the devouring and fiery fury of the poyson, renting 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, urinary passage and fundament, and then their case is desperate. These and who else soever shall take any corroding poyson, shall be cured with the same remedies, as those that have taken *Cantharides*.

The symptoms of such as have taken *sublimate*.

Verdegrease so stops the instruments of respiration that it strangles such as have taken it. The cure is performed by the same remedies as help those that have taken Arsenick.

Verdegrease.

Litharge causeth a heaviness in the stomach, suppresseth urine, makes the body swelled and livid. We remedy this, by giving 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 clysters, and to anoint the belly with fresh butter or oil of lillies.

Litharge.

The scales of Brass drunk, by troubling the stomach, cause a casting and scouring. The remedy is, if the patient forthwith vomit, if he enter into a bath made of the decoction of Snails, if he anoint his belly and breast with butter or oil of lillies, and inject laxative and humecting clysters.

The scales of Brass.

The loadstone makes them mad that take it inwardly. The Antidote thereof is the powder of gold, and an emerald drunk in strong wine, and clysters of milk and oil of sweet almonds.

The Loadstone

The filings of Lead, and the scales or *refuse* of Iron, cause great torment to such as take them down. The which we help with much milk and fresh butter dissolved therein, or with oil of sweet almonds drawn without fire, with relaxing and humecting clysters used until the pain be perfectly asswaged.

Filings of Lead and scales of Iron.

Risagallum, Rose-aker or Rats-bane, because it is of a most hot and dry nature, induces thirst and heat over all the body, and so great colliquation of all the humors, that although the patients by medicines speedily given escape death, yet can they not during the residue of their lives, use their members as they formerly did, being destitute of their strength, by reason of the great drineſs and contraction of the joints. The Antdiote thereof is oil of Pine-kernels speedily given, and that to the quantity of half a pint; then procure vomit, then give much milk to drink, and clysters of the same, and let them sup up fat broths.

Arsenick, Rose-aker or Rats-bane.

Unquencht Lime and *Auripigmentum*, or Orpiment drunk, gnaw the stomach and guts with great tormenting pain, and cause unquenchable thirst, an asperity of the jaws and throat, difficulty of breathing, stopping of the urine, and a bloody flux, They may be helped by oil, fat, humecting and relaxing things which retund the acrimony by lenitive potions, and such as lubricate the belly; as also by creams, and the mucilages of some seeds, as with a decoction of the seeds of *Line*, mallows, marsh-mallows and other things set down at large in the cure of *Cantharides*.

Unquenched Lime and Orpiment.

Those exceeding acrid and strong waters wherewith Goldsmiths and Chymists separate Gold from silver, being taken into the body, are hard to cure, because they are forthwith diffused over all the body, first burning the throat and stomach. Yet it may be helped by the means prescribed against unquenched Lime and Orpiment.

Aqua fortis.

Cerus causeth hicketting and a cough, makes the tongue dry, and the extreme parts of the body numb with cold, the eyes heavy to sleep. The patients very often in the midst of the day see some vain phantasie or apparition, which indeed is nothing; they make a black and oftentimes bloody water, they die strangled unless they be helped. The Antidote in the opinion of *Aetius* and *Avicen*, is Scammony drunk in new wine, or hony and wine, and other diuretick things, and such things as procure vomit, and purge by stool.

Cerus.

Plaster, because it concreteth and becometh stony in the stomach, causeth strangulation, by straitning and stopping the instruments that serve for breathing. The patients receive cure by the same remedies as those who have eaten mushroom, or drunk Cerus: you must add Goose-grease in Clysters, and anoint the belly with oil of lillies and butter.

Plaster.

CHAP. XXXVIII.

Of Quick silver.

QUick-silver is so called because it resembleth silver in the colour, and is in perpetual motion, as if it had a spirit or living soul, there is a great controversie amongst authors concerning it, for most of them affirm it hot, among whom is *Galen*, *Haly abas*, *Rhasis*, *Aristotle*, *Constantine*, *Isaac*, *Platearius*, *Nicholas Massa*: they maintain their opinion by an argument drawn from things helping and hurting; besides from this, that it is of such subtle parts, that it penetrates, dissolves and performeth all the actions of heat upon dense and hard metals, to wit, it attenuateth, incideth, drieth, causeth salivation by the mouth, purgeth by the stool, moveth urine and sweat over all the body; neither doth it stir up the thinner humors only, but in like sort the gross tough and viscous, as those which have the *Lues venerea* find by experience, using it either in ointments or Plasters. The reason why it is so called. *Lib. 4. sum. in 2. pract. c. 148. 3. ad almans. 4. Meteor.*

Others affirm it very cold and moist, for that put into emplasters and so applied, it asswageth pain by stupefaction, hindering the acrimony of pustles and cholerick inflammations. But by its humidity it softneth scirrhous tumors, dissolveth and dissipateth knots and *tophus* knobs, besides, it causeth the breath of such as are anointed therewith to stink, by no other reason, than that it putrefies the obvious humor by its great humidity. *Avicen*'s experiment confirms this opinion, who affirmeth, that the blood of an Ape that drunk Quick-silver, was found concrete about the heart, the carcass being opened. *Matthiolus* moved by these reasons, writes that Quick-silver killeth men by the excessive cold and humid quality, if taken in a large quantity, because it congeals the blood and vital spirits, and at length the very substance of the heart, as may be understood by the history of a certain Apothecary, set down by *Conciliator*; who, for to quench his feaverish heat, in stead of water, drunk a glass of Quick-silver, (for that first came to his hands;) he died within a few hours after, but first he evacuated a good quantity of the Quick-silver by stool, the residue was found in his stomach being opened, and that to the weight of one pound; besides, the blood was found concrete about his heart. Others use another argument to prove it cold, and that is drawn from the compolition thereof, because it consists of Lead and other cold metals. But this argument is very weak. For unquencht Lime is made of flints and stony matter, which is cold, yet nevertheless it exceeds in heat. *Paracelsus* affirmeth, that Quick-silver is hot in the interior substance, but cold in the exterior, that is, cold as it comes forth of the *Mine*. But that coldness to be lost as it is prepared by art, and heat only to appear and be left therein, so that it may serve instead 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 watery substance that is predominant in them, but that inwardly they are very hot, which then appears when as the coldness together with the moisture is segregated, for by calcination they become caustick. Moreover many account quick-silver poison, yet experience denies it. For *Marianus Sanctus Boralitanus* tells that he 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 any harm. Moreover he affirmeth that he hath known sundry who in a desperate Colick (which they commonly call *miserere mei*) have been freed from imminent death, by drinking three pounds of quick-silver with water only: For by the weight it opens and unfolds the twined or bound up gut, and thrusts forth the hard and stopping excrements; he addeth that others have found this medicine effectual against the colick, drunk in the quantity of three ounces. *Antonius Musa* writes, that he usually giveth Quick-silver to children ready to die of the worms. *Avicen* confirmeth this, averring that many have drunk Quick-silver without any harm, wherefore he mixeth it in his ointments against scales and scabs in little children; whence came that common medicine amongst country people to kill lice by anointing the head with Quick-silver mixed with butter or *axungia*. *Matthiolus* affirmeth that many think it the last and chiefest remedy to give to women in travel that cannot be delivered. I protest to satisfie my self concerning this matter, I gave to a whelp a pound of Quick-silver, which being drunk down, it voided without any harm by the belly. Whereby you may understand that it is wholly without any venemous quality. Verily it is the only and true Antidote of the *Lues venerea*, and also a very fit medicine for all malign ulcers, as that which more powerfully impugns their malignity than any other medicines that work only by their first qualities. Besides, against that contumacious scab, which is vulgarly called *Malum sancti manis*, there is not any more speedy or certain remedy. Moreover *Guido* writes, that if a plate of lead be besmeared or rubbed therewith, and then for some 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 often found true by experience. *In l. 6. Disc. c. 2.* An History. *Lib. 4. de nat. rerum.* *Tract. de caus & effect.* Quick-silver good for women in travel. For the disease called *Malum sancti manis.*

Certainly before *Guido*, *Galen* much commended Quick-silver against malign ulcers and cancers: Neither doth *Galen* affirm that lead is poysonous (which many affirm poysonous, because it consists of much Quick-silver) but he only 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 bloody fluxes, which also is familiar to brass and copper. Otherwise many could not without danger bear in their bodies leaden bullets during the space of so many years, as usually they do. It is reported. It is declared by *Theodores Hercy* in the following histories, how powerful Quick-silver is to resolve and asswage pain and inflammations. Not long since, (saith he) 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 there present, I applied an *Anodyne* 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 *Lib. de comp. med. secund. loc.* Against malign ulcers. Against the *Parotides.*

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an *Anodyne* Cataplasm, observed that there was Quick-silver mixed therewith, and this happened through the negligence of the Apothecary, who mixed the simple *Anodyne* medicine prescribed by us, in a mortar wherein but a while before he had mixed an ointment whereinto Quick-silver had entred, whose reliques, and some part thereof yet remained therein. This which once by chance succeeded well, I afterwards wittingly and willingly used to a certain Gentlewoman troubled with the like disease, possessing all the region behind 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 some Quick-silver, so within a few days, the tumor was digested and resolved. But some will say it resolves the strength of the nerves and limbs, as you may see by such as have been anointed therewith for the *Lues venerea*, who tremble in all their limbs during the rest of their lives. This is true, if any use it too intemperately without measure, and a disease that may require so great a remedy; for thus we 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 nerves, by resolving the spirits, and dissipating the radical and substantifick moisture, maketh them subject to the trembling of their joints. Verily, if it be killed and incorporate with hogs-grease, and a list besmeared therewith, which may encompass the body like a girdle, it will drive away lice, fleas and *cimices*; and anointed about the navel, it kills 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 Ivory. Also it is probable that by art it may be extracted out of all metals, but chiefly out of Lead and *Cinnabaris*. You may easily distinguish these kinds by the dull and blackish colour, tough and gross substance, which as it runs, leaves an impression like melted greafe, being as it were the excrement of lead. The best Quick-silver of all is pure, clear, thin, and very white: it may be cleansed with the dross of lead, and becomes more then being boiled in sharp vinegar, with *Sage*, *rosemary*, *tyme*, *lavender*, Or else give it by a pound at a time to a whelp to drink down, and being cast forth by it, boil it again in vinegar, for thus it hath wondrous faculties, and fitly given produceth marvelous effects; nothing is more contrary thereto than fire. For Quick-silver though of its own nature ponderous, flieth upwards by the force of the fire, and forsaketh gold by that means, than which nothing is more friendly to it.

Against lice and flies, &c.

The kinds thereof.

How to purifie it.

CHAP. XXXIX.

Of the Unicorns Horn.

There are very many at this day who think themselves excellently well armed against poyson and all contagion, if they be provided with some powder of Unicorns-horn, or some infusion made therewith. Therefore I have though 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 discourse. The first shall be of the signification of this word *Unicorn*. The second, whether there be any such thing really and truly so called, or whether it be not rather imaginary; like as the *Chimera* and *Tragelaphus*? The third, whether that which is said to be the horn of such a beast, hath any force or faculty against poysons? For the first, that is, the name, it is somewhat more obscure what the word (being *Licorn*) in French may signifie, than 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 having 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 imaginary than really in the world. I am chiefly induced to believe thus, by these conjectures. Because of those who have travelled over the world, there is not one that professeth that ever he did see that creature. Certainly the *Romans* conquered the world, and being most diligent searchers after all things which were rare and so excellent, if any where in any 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 been delivered by tradition, or what they in their minds and fancies have conceived, you shall scarce find two that agree together, either in the description of the body, or in the nature and condition of her. *Pliny* writes, that Unicorns are for the fashion of their bodies like to an horse; that is, as *Cardane* interprets it, of the bigness of an Horse, with the head of an Hart, the feet of an Elephant, the tail of a *Boar*, with one black horn in the midst of his forehead, of the length of two cubits. *Munster*, who (as *Matthiolus* jests) never saw Unicorns besides painted ones, doth on the contrary affirm them not to be of the bigness of an Horse, but of an Hind-calf of three months old, not with feet like an Elephant, but cleft like those of Goats, with an horn not only of two, but oft-times of three cubits long, of a Weazle-colour, with a neck not very long, nor very hairy, but having few and short hairs hanging to the one side of the neck, the legs are lean and small, the buttocks high, but very hairy. *Cardane* dissenting from both these, writes that he hath an horn in the midst of his forehead, but that it is only of the length of three fingers. *Andrew Thevet* mentions an Unicorn seen by a certain Turkish Sanjach, which was of the bigness of a Bull, of five or six months old, and had one horn, but that not in the midst of his forehead, but upon the top of the crown of the head; he was legged and footed like an Ass, but longer haired, and had ears not much unlike the *Rangifer*, a beast not unknown in the *subpolar* 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

Thus various therefore is the report concerning the shape of this Beast. Neither is there less difference concerning her nature and conditions. For *Pliny* writes, that the Unicorn is a most fierce beast, and hath a great bellowing voice, and that she cannot therefore be taken alive. *Cardane* renders a reason of this fierceness, *Because (saith he) it inhabits the deserts of* Æthiopia, *a region squalid, and filthy, abounding with Toads, and such like venemous creatures.* Others on the contrary affirm her to be of a most mild, amiable, and gentle nature of all others, unless one purposely offend her, or use her too harshly, for seeing she feeds not by stooping her head to the ground, because she is hindred therefrom by the length of her horn, she must necessarily feed upon the fruit that hangeth upon trees; out of cratches or mans hand she fearlesly and harmlesly takes all manner of fruits, herbs, sheaves of corn, apples, pears, oranges and pulse. And herein they have proceeded so far, that they feign they will love Virgins, entised by their beauty, so that stayed in the contemplation of them, and allured by their enticements, they by this means are often taken by hunters. In this opinion is *Lues Vartoman*, who denies that Unicorns are wild or fierce; for he saith, that he saw two, which were sent out of *Æthiopia* to the Sultan, who kept them shut up in Penns, in *Mecha*, a city of *Arabia Felix*, renowned by the Sepulcher of *Mahomet*. *Theves* travelling thither, tells that he diligently inquired of the inhabitants, what their opinion was of such a beast, yet could he never hear any tidings thereof. Whence it is easie to discern, that such beasts have neither been in our, nor in *Vartomans* times. The so great variety of dissenting opinions, easily induceth me to believe that this word, *Unicorn*, is not the proper name of any beast in the world, and that it is a thing only feigned by Painters, and Writers of natural things, to delight the readers and beholders. For as there is but one right way, but many by-ways, and windings, so the speech of truth is but one, and that always simple and like it self; but that of a lie is diverse, and which may easily refel it self, by the repugnancy and incongruity of opinions, if one should say nothing. What therefore (will some say of what creatures) are these horns, which we see wholly different from others, if they be not of Unicorns? *Theves* thinks them nothing else than Elephants bones turned and made into the fashion that we see them, for thus in the Eastern Countries, some crafty merchants and cunning companions turn, hollow, and being softned, draw to what length these please the teeth of the fish *Rohard*, which lives in the Red and *Æthiopian* Sea, and being so handled, they sell them for Unicorns horn. Verily that which is termed Unicorns horn, being burnt, sends forth a smell like to Ivory. Now *Cardanus* affirms that the teeth and bones of Elephants made soft by art, may be drawn forth, and brought into what form you please 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 we come to the third scope. Grant there be Unicorns; must it therefore follow that their horns must be of such efficacy against poysons? If we judg by events, and the experience of things, I can protest thus much, that I have often made trial thereof, yet could I never find any good success in the use thereof against poysons, in such as I have had in cure. If the matter must be tried by witnesses and authorities, 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 done, moved thereto by many just, but two especial reasons. The first is of *Rondeletius*, who in this case affirms that horns are endued with no taste nor smell; and therefore have no effect in Physick, unless it be to dry: neither (saith he) 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 shavings or scrapings of Unicorns horn, which they sell for the weight in gold, as that which is singular good against poysons and worms, which things, I think, Harts-horn and Ivory do no less effectually perform; which is the cause why, for the same disease, and with the like success, I prescribe Ivory to such as are poor, and Unicorns horn to the rich, as that they so much desire. This is the opinion of *Rondeletius*, who, without any difference, was wont, for Unicorns horn, to prescribe not only Harts-horn or Ivory, but also the bones of Horses and Dogs, and the stones of Myrobalanes. Another reason is, that whatsoever resists poyson is cordial, that is, fit to strengthen the heart, which is chiefly assailed by poysons; but nothing is convenient to strengthen the heart, unless it be by laudable blood or spirit, which two are only familiar to the heart, as being the work-house of the arterious blood and vital spirits: For all things are preserved by their like, as they are destroyed by their contraries, for all things that generate, generate things like themselves. But Unicorns horn, as it contains no smell, so neither hath it any aery parts, but is wholly earthy and dry; neither can it be converted into blood by the digestive faculty, for as it is without juice, so is it without flesh: For as it cannot be turned into *Chylus*, so neither is it fit to become *Chymus*, that is, juice or blood. Therefore it is joyned to the heart by no similitude, nor familiarity. Furthermore there is not a word in *Hippocrates* and *Galen* concerning the Unicorns horn, who notwithstanding have in so many places, commended Harts-horn. Therefore D. *Chapelain*, the chief Physician of King *Charles* the ninth often used to say, that he would very willingly take away that custom of dipping a piece of Unicorns horn in the Kings cup, but that he knew that opinion to be so deeply ingrafted in the minds of men, that he feared, that it would scarce be impugned by reason. Besides (he said) if such a superstitious medicine do no good, so certainly it doth no harm, unless it be to their estates that buy it with gold; or else by accident, because Princes, whilst they relie more than is fitting upon the magnified vertues of this horn, neglect to arm themselves against poysons by other more convenient means, so that death oft-times takes them at unawares. When as upon a time I inquired of *Lues Dures* the Kings Physician and Professor (by reason of the great opinion that all learned men justly had of his learning and judgment) what he thought of this horn; He answered that he attributed no faculties thereto; for the confirmation whereof he rendred the second reason I have formerly given, but more largely and elegantly; neither feared he to affirm it aloud, and in plain words to his auditory of learned men, coming from all parts to hear him. But if at any time (orecome by the fault of the times and place) he prescribed this horn; that he did it for no other intent, than to help faint-

Vartomans opinion of the nature of the Unicorn.

What the ordinary *unicorns* horns are

The *Unicorns* horn is not effectual against poyson.

Lib. de pondr. cap. 19.

Horns and bones not effectual unless to dry.

In what cases good.

ings

ings or ſwoundings that happen by the abundance of ſerous humors, floating in the orifice of the ventricle, which makes men ill diſpoſed, becauſe this mixed with other things endued with the like faculty, hath power to drink up the wateriſh humidity by its earthy drineſs. But ſome will reply, that neither the *Lemnian*, nor *Armenian* earth, have any juice in them, neither any ſmell, nor aery ſpirit. It is granted; neither truly are ſuch things truly and properly called cordial, but only by event and accident, for that by the excellent and aſtrictive faculty they have, and ſtopping the paſſages of the veſſels, they hinder the poiſon from entring into the heart. This is my opinion of the Unicorns horn, which if any do not approve of, he ſhall do me a favour, if for the publick good, he ſhall freely oppoſe his; but in the *interim* take this in good part which I have done.

The end of the one and twentieth Book.

BOOK XXII.

Of the PLAGUE.

CHAP. I.

The deſcription of the Plague.

What the Plague is.

THE Plague is a cruel and contagious diſeaſe, which every where, like a common diſeaſe, invading Man and Beaſt, kills very many; being attended, and as it were aſſociated with a continual Feaver, Botches, Carbuncles, Spots, Nauſeouſneſs, Vomitings, and other ſuch malign accidents. This diſeaſe is not ſo pernicious or hurtful, by any elementary quality, as from a certain poyſonous and venenate malignity, the force whereof exceeds the condition of common putrefaction; Yet I will not deny, but that it is more hurtful in certain bodies, times and regions, as alſo many other diſeaſes, of which *Hippocrates* makes mention. *Sect. 3. aphor.* But from hence we can only collect, that the force and malignity of the plague may be encreaſed, or diminiſhed, according to the condition of the elementary qualities concurring with it; but not the whole nature and eſſence thereof to depend thereon.

How it comes to kill.

This peſtiferous poyſon principally aſſails the vital ſpirit, the ſtore-houſe and original whereof is the heart, ſo that if the vital ſpirit prove ſtronger, it drives it far from the heart; but if weaker, it being overcome and weakned by the hoſtile aſſault, flies back into the fortreſs of the heart, by the like contagion infecting the heart, and ſo the whole body, being ſpread into it, by the paſſages of the arteries.

Hence it is, peſtilent feavers are ſometime ſimple and ſolitary; otherwhiles aſſociated with a troop of other affects, as Botches, Carbuncles, Blanes and Spots, of one or more colours.

The original of baboes, carbuncles, &c. in the plague.

It is probable ſuch affects have their original from the expulſive faculty, whether ſtrong or weak, provoked by the malignity of the raging matter: yet aſſuredly divers ſymptoms and changes ariſe, according to the conſtitution of the body of the patient, and condition of the humor in which the virulency of the plague is chiefly inherent, and laſtly in the nature of the efficient cauſe.

I thought good, by this deſcription, to expreſs the nature of the Plague, at this my firſt entrance into this matter; for we can ſcarce comprehend it in a proper definition. For although the force thereof be definite, and certain in nature, yet it is not altogether certain and manifeſt in mens minds, becauſe it never happens after one ſort: ſo that in ſo great variety, it is very difficult to ſet down any thing general and certain.

CHAP. II.

Of the Divine cauſes of an extraordinary Plague.

Amos 3. *Acts* 17.

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 punithing offences. The Prophet *Amos* hath long ſince taught it, ſaying, *Shall there be affliction? Shall there be evil in a City, and the Lord hath not done it?* On which truly we ought daily to meditate, and that for two cauſes: The firſt is, that we always bear this in mind, that we enjoy health; live, move, and have our beings from God; and that it deſcends from that Father of Light; and for this cauſe we are always bound to give him great and exceeding thanks. The other is, that knowing the calamities, by ſending whereof the Divine anger proceeds to revenge, we may at length repent, and leaving the way of wickedneſs, walk in the paths of Godlineſs. For thus we ſhall learn to ſee in God, our ſelves, the Heaven and Earth, the true knowledge of the cauſes of the plague, and by a certain Divine Philoſophy, teach God to be the beginning and cauſe of the ſecond cauſes, which we cannot well without the firſt cauſe go about nor attempt, much leſs perform any thing. For from hence they borrow their force, order, and conſtancy of order; ſo that they ſerve as inſtruments for God, who rules and governs us, and the whole world to perform all his works, by that conſtant courſe of order, which he hath appointed unchangeable from the beginning.

The ſecond cauſes have their power from God as the firſt cauſe.

Wherefore

Wherefore all cauſe of a plague is not to be attributed to theſe near and inferior cauſes or beginnings, as the Epicures and Lucianiſts commonly do, who attributing too much, yea all things to Nature, hath left nothing to Gods providence. On the contrary, we ought to think, and believe in all our doings, That even as God by his omnipotent Power hath created all things of nothing, ſo he by his eternal Wiſdom preſerves and governs the ſame, leads and inclines them as he pleaſeth, yea verily at his pleaſure changeth their order, and the whole courſe of nature.

This cauſe of an extraordinary Plague, as we confeſs and acknowledge, ſo here we will not proſecute it any further, but think fit to leave it to Divines, becauſe it exceeds the bounds of Nature, in which I will now contain my ſelf. Wherefore let us come to the natural cauſes of the Plague.

CHAP. III.

Of the Natural cauſes of the Plague, and chiefly of the Seminary of the Plague by the corruption of the Air.

THe general and natural cauſes of the Plague are abſolutely two, that is, the infection of corrupt air, and a preparation and fitneſs of corrupt humors to take that infection; for it is noted before, out of the doctrine of *Galen*, that our humors may be corrupted, and degenerate into ſuch an alienation as may equal the malignity of poyſon. The general cauſes of the Plague. *Lib. 6. de loc. affectis.*

The air is corrupted, when the four ſeaſons of the year have not their ſeaſonableneſs, or degenerate from themſelves, either by alteration or by alienation: as if the conſtitution of the whole year be moiſt and rainy, by reaſon of groſs and black clouds; if the Winter be gentle and warm, without any Northerly wind, which is cold and dry, and by that means contrary to putrefaction: if the Spring which ſhould be temperate, ſhall be faulty in any exceſs of diſtemper; if the Autumn ſhall be ominous by fires in the air, with ſtars ſhooting, and as it were falling down, or terrible comets, never ſeen without ſome diſaſter; if the ſummer be hot, cloudy and moiſt, and without winds, 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 any, than by *Hippocrates* in his Books *Epidemion*. Therefore the air from hence draws the ſeeds of corruption and the peſtilence, which at length, the like exceſs of qualities being brought in, it ſends into the humors of our bodies, chiefly ſuch as are thin and *ſerous*; although the peſtilence doth not always neceſſarily ariſe from hence, but ſome-whiles ſome other kind of cruel and infectious diſeaſe. How the ſeaſons of the year may be ſaid to want their ſeaſonableneſs.

But neither is the air only corrupted by theſe ſuperiour cauſes, but alſo by putrid and filthy ſtinking vapors ſpread abroad through the air encompaſſing us, from the bodies and carkaſſes of things not buried, gapings and hollowneſſes of the earth, or ſinks and ſuch like places being opened: for the ſea often overflowing the land in ſome places, and leaving in the mud or hollowneſſes of the earth (cauſed by earth-quakes) the huge bodies of monſtrous fiſhes, which it hides 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 cauſed a plague over all that countrey. How the air may be corrupted.

But as fiſhes infect and breed a plague in the air, ſo the air being corrupted often cauſeth 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 riſing into the air through the body of the water, the latter whereof *Ariſtotle* ſaith, happeneth but ſeldom. But it often chanceth, that the plague raging in any country, many fiſhes are caſt upon the coaſt, and may be ſeen lying on great heaps. But ſulphureous vapors, or ſuch as partake of any other malign quality, ſent forth from places under ground, by gapings and gulfs opened by earth-quakes, not only corrupt the air, but alſo infect and taint the ſeeds, plants, and all the fruits which we eat, and ſo transfer the peſtilent corruption into us, and thoſe beaſts on which we feed, together with our nouriſhment. The truth whereof *Empedocles* made manifeſt, who by ſhutting up a great gulf of the earth, opened in a valley between two mountains, freed all *Sicily* from a plague cauſed from thence. *Lib. 8. hiſt. Anim.*

If winds riſing ſuddenly ſhall drive ſuch filthy exhalations from thoſe regions in which they were peſtiferous, into other places, they alſo will carry the plague with them thither.

If it be thus, ſome 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 noyſome poyſon the people which work in ſuch places: but experience finds this falſe.

We do anſwer that the Putrefaction of the Plague is far different, and of another kind than this common, as that which partakes of a certain ſecret malignity, and wholly contrary to our lives, and of which we cannot eaſily give a plain and manifeſt reaſon. Yet that vulgar putrefaction whereſoever it, doth eaſily and quickly entertain and welcome the peſtiferous contagion, as often as, and whenſoever it comes, as joined to it by a certain familiarity, and at length, it ſelf degenerating into a peſtiferous malignity, certainly no otherwiſe than thoſe diſeaſes which ariſe in the plague time, the putrid diſeaſes in our bodies, which at the firſt wanted virulency and contagion, as Ulcers, putrid Feavers, 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 be 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 ſeize upon all) ſo that the impreſſion of the peſtiferous quality may preſently follow that diſpoſition. Peſtiferous putrefaction is far different from ordinary putrefaction.

In a peſtilent conſtitution of the air, all diſeaſes become peſtilent. *Lib. 1. de diffe. feb.*

We

How the air may be said to putrefie.

But when we say the air is pestilent, we do not understand that sincere, elementary, and simple, as it is of its own nature, for such is not subject to putrefaction; but that which is polluted with ill vapors rising from the earth, standing waters, vaults, or sea, and degenerates, and is changed from its native purity and simplicity. But certainly amongst all the constitutions of the air, fit to receive a pestilent corruption, there is none more fit than an hot, moist and still season; for the excess of such qualities easily causeth putrefaction. Wherefore the south wind reigning, which is hot and moist, and principally in places near the sea, there flesh cannot long be kept, but it presently is tainted and corrupted

A Southerly constitution of the air is the fuel of the Plague.

Further, we must know, that the pestilent malignity 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 comes from sheep, to sheep; by a certain sympathy and familiarity of Nature: no otherwise than the Plague which shall seize upon some one in a Family, doth presently spread more quickly amongst the rest of the Family, by reason of the similitude of temper, then amongst others of an other Family, disagreeing in their whole temper. Therefore the air thus altered and estranged from its goodness of nature, necessarily drawn in by inspiration and transpiration, brings in the seeds of the Plague, and so consequently the Plague it self, into bodies prepared and made ready to receive it.

CHAP. IV.

Of the preparation of humors to putrefaction, and admission of pestiferous impressions.

HAving shewed the causes from which the air doth putrifie, become corrupt, and is made partaker of a pestilent and poysonous constitution; we must now declare what things may cause the humors to putrifie, and make them so apt to receive and retain the pestilent air and venenate quality.

Three causes of the putrefaction of humors.

Humors putrifie either from fulness, which breeds obstruction, or by distemperate excess; or lastly, by admixture of corrupt matter and evil juice, which ill feeding doth specially cause to abound in the body: for the Plague often follows the drinking of dead and musty wines, muddy and standing waters, which receive the sinks and filth of a City; and fruits and pulse eaten without discretion in scarcity of other corn, as Pease, Beans, Lentils, Vetches, Acorns, the roots of Fern, and Grass made into Bread: For such meats obstruct, heap up ill humors in the body, and weaken the strength of the faculties, from whence proceeds a putrefaction of humors, and in that putrefaction a preparation and disposition to receive, conceive, and bring forth the seeds of the Plague: which the filthy scabs, malign sores, rebellious ulcers and putrid feavers, being all fore-runners of greater putrefaction and corruption, do testifie. Vehement passions of the mind, as anger, sorrow, grief, vexation and fear, help forward this corruption of humors, all which hinder natures diligence and care of concoction: For as in the Dog-days, the lees of wine subsiding to the bottom, are by the strength and efficacy 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, being the dregs or lees of the blood, stirred by the passions of the mind, defile or taint all the blood with their feculent impurity.

Passions of the mind help forward the Putrefaction of the humors.

We found that, some years agon by experience, at the battel of S. *Dennis*. For all wounds, by what weapon soever they were made, degenerated into great and filthy putrefactions and corruptions, with feavers of the like nature, and were commonly determined by death, what medicines and how diligently soever they were applied; which caused many to have a false suspition that the weapons on both sides were poysoned. But there were manifest signs of corruption and putrefaction in the bloud let the same day that any were hurt, and in the principal parts dissected afterwards that it was from no other cause, than an evil constitution of the air, and the minds of the Souldiers perverted by hate, anger and fear.

CHAP. V.

What signs in the Air and Earth prognosticate a Plague.

WE may know a plague to be at hand and hang over us, if at any time the air and seasons of the year swerve from their natural constitution, after those ways I have mentioned before; if frequent and long continuing Meteors, or sulphureous Thunders infect the air; if fruits, seeds, and pulse be worm-eaten: if birds forsake their nests, eggs, or young, without any manifest cause; if we perceive women commonly to abort, by continual breathing in the vaporous air, being corrupted and hurtful both to the Embryon and original of life, and by which it being suffocated, is presently cast forth and expelled. Yet notwithstanding those airy impressions do not solely corrupt the air, but there may be also others raised by the Sun from the filthy exhalations and poysonous vapors of the earth and waters, or of dead carkasses, which by their unnatural mixture, easily corrupt the air, subject to alteration, as that which is thin and moist, from whence divers Epidemical diseases, and such as are every where seize upon the common sort, according to the several kinds of corruptions, such as that famous *Catarrh* with difficulty of breathing, which in the year 1510 went almost all over the world, and raged over all the Cities and Towns of *France*, with great heaviness of the head (whereupon the French named it *Cuculla*) with a straitness of the heart and lungs, and a cough, a continual feaver, and sometimes raving.

Why aborti-ons are fre-quent in a pe-stilent season.

A *Catarrh* with difficulty of breathing kil-ling many.

This, although it seized upon many more than it killed, yet because they commonly died who were either let bloud, or purged, it shewed it self pestilent by that violent and peculiar and unheard of kind of malignity.

Such

Such alſo was the Engliſh *Sweating-ſickneſs*, or *Sweating-feaver*, which unuſual, with a great deal of terror invaded all the lower parts of *Germany*, and the Low-Countries, from the year 1525 unto the year 1530, and that chiefly in Autumn. The Engliſh *Sweating-ſickneſs*.

As ſoon as this peſtilent diſeaſe entred into any City, ſuddenly two or three hundred fell ſick on one day; then it departed thence to ſome other place. The people ſtrucken with it, languiſhing, fell down in a ſwound, and lying in their beds, ſweat continually, having a feaver, a frequent, quick, and unequal pulſe; neither did they leave ſweating, till the diſeaſe left them, which was in one or two days at the moſt: yet freed of it, they languiſhed long after; they all had a beating or palpitation of the heart, which held ſome two or three years, and others all their life after.

At the firſt beginning it killed many, before the force of it was known: but afterwards very few, when it was found out by practice and uſe, that thoſe who furthered and continued their ſweats, and ſtrengthened themſelves with cordials, were all reſtored. But at certain times many other popular diſeaſes ſprung up, as putrid feavers, fluxes, bloudy-fluxes, catarrhs, coughs, phrenſies, ſquinances, plurifies, inflammations of the lungs, inflammations of the eyes, apoplexies, lethargies, ſmall pox and meazles, ſcabs, carbuncles, and malign puſiles. Wherefore the Plague is not always, nor every where of one and the ſame kind, but of divers; which is the cauſe that divers names are impoſed upon it, according to the variety of the effects it brings, and ſymptoms which accompany it, and kinds 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 Muſhrooms grow in greater abundance out of the Earth, and upon the ſurface thereof many kinds of poyſonous *inſecta* creep in great numbers, as Spiders, Catterpillars, Butter-flies, Graſhoppers, Beetles, Hornets, Waſps, Flies, Scorpions, Snails, Locuſts, Toads, Worms, and ſuch things as are the off-ſpring of putrefaction. And alſo wild beaſts tired with the vaporous malignity 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 remove their habitations in great troops. For theſe, as alſo ſome other creatures, have a manifeſt power by the gift of God, and the inſtinct of Nature, to preſage changes of weather, as rains, ſhowers, 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 ſome of them which took leſs heed of themſelves, ſuffocated by the peſtiferous poyſon of the ill air contained in the earth, may be every where found, not only 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 malignity, 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 kills thoſe creatures which feed upon them; yet brute beaſts ſooner than men, as which ſtoop and hold their heads down towards the ground (the maintainer and breeder of this poyſon) that they may get their food from thence. Therefore at ſuch times, skilful husbandmen, taught by long experience, never drive 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 abiding upon the boughs and leaves of trees, herbs, corn and fruits. How peſtilent vapors may kill plants and trees.

But on the contrary, that peſtilence which proceeds from ſome malign quality 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 uſing what cautions in Air and diet, one may prevent the Plague.

HAving declared the ſigns foreſhewing a Peſtilence: now we muſt ſhew by what means we may ſhun the imminent danger thereof, and defend our ſelves from it. No prevention ſeemed more certain to the Antients, than moſt ſpeedily to remove into places far diſtant from the infected place, and to be moſt ſlow in their return thither again. But thoſe, who by reaſon of their buſineſs or imployments, 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 dayly imminent invaſions of the poyſon, or the peſtiferous and venenate Air. The other, that they abate the force of it, that it may not imprint its virulency in the body; which may be done by correcting the exceſs of the quality inclining towards it, by the oppoſition of its contrary: For if it be hotter than 'is meet, it muſt be tempered with cooling things; if too cold, with heating things: yet this will not ſuffice: For we ought beſides, to amend and purge the corruptions of the venenate malignity diffuſed through it, by ſmells and perfumes reſiſting the poyſon thereof. The body will be ſtrengthened and more powerfully reſiſt the infected Air, if it want excrementitious humors, which may be procured by purging and bleeding; and for the reſt a convenient diet appointed, as ſhunning much variety of meats, and hot and moiſt things, and all ſuch which are eaſily corrupted in the ſtomach, and cauſe obſtructions, ſuch as thoſe things which be made by Comfit-makers; we muſt ſhun ſatiety 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 exerciſes in a clear Air, and free from any venemous tainture, precede your meals.

Let the belly have due evacuation either by Nature or Art.

Let the heart, the ſeat of life, and the reſt of the bowels be ſtrengthened with Cordials and Antidotes applied and taken (as we ſhall hereafter ſhew) in the form of epithems, ointments, emplaſters, waters, pills, 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

Discommodities of a cloudy or foggy Air.

such as is most fit to preserve life, to recreate and repair the spirits, whereas on the contrary, a cloudy, or misty Air, and such as is infected with gross and stinking vapors, dulls the spirits, dejects the appetite, makes the body faint and ill coloured, oppresseth the heart, and is the breeder of many diseases.

Why the South wind is pestilent.

The Northern wind is healthful, because it is cold and dry. But on the contrary, the Southern wind because it is hot and moist, weakens the body by sloth or dulness, opens the pores, and makes them pervious to the pestiferous malignity. The Western wind is also unwholsome, because it comes near to the nature of a Southern: wherefore the windows must be shut up on that side of the house on which they blow, but open on the North and East side, unless it happen that the Plague come from thence.

The efficacy of fire against the Plague.

Kindle a clear fire in all the lodging Chambers of the house, and perfume the whole house with Aromatick things, as Frankincense, Myrrh, Benzoin, *Ladanum*, *Styrax*, Roses, Myrtle-leaves, Lavender, Rosemary, Sage, Savory, wild Tyme, Marjoram, Broom, Pine-apples, pieces of Fir, Juniper-berries, Cloves, Perfumes: and let your cloaths be aired in the same.

There be some, who think it a great preservative against the pestilent Air, to keep a Goat in their houses, because the capacity of the house, filled with a strong sent which the Goat sends forth, prohibits the entrance of the venomous Air: which same reason hath place also in sweet smells; and besides it argues,

Moderate repletion good for prevention

that such as are hungry are apter to take the Plague than those who have eaten moderately: for the body is not only strengthened with meat, but all the passages thereof are full by the vapors diffused from thence, by which otherwise, the infected Air would find a more easie entrance to the heart.

Yet the common sort of people yield another reason for the Goat, which is, that one ill sent drives away another, as one wedge drives forth another; which calleth to my mind that which is recorded by *Alexander Benedictus*, that there was a Scythian Physician, which caused a Plague, arising from the infection of the Air, to cease, by causing all the Dogs, Cats, and such like beasts, which were in the City to be killed, and cast their carkasses up and down the streets, that so by the coming of this new putrid vapor as a stranger, the former pestiferous infection, as an old guest was put out of its lodging, and so the Plague ceased. For Poysons have not only an antipathy with their Antidotes, but also with some other poysons.

A strange Art to drive away the Plague.

The antipathy of poisons with poisons.

Whilst the Plague is hot, it is good not to stir out of door before the rising of the Sun: wherefore we must have patience, until he hath cleansed the Air with the comfortable light of his beams, and dispersed all the foggy and nocturnal pollutions, which commonly hang in the Air in dirty, and especially in low places and Vallies.

All publick and great meetings and assemblies must be shunned.

Whether in the Plague-time one must travel by night or by day.

If the Plague begin in Summer, and seem principally to rage, being helped forward by the Summers heat, it is best to perform a journy begun, or undertaken for necessary affairs, rather upon the night time, than on the day; because the infection takes force, strength and subtility of substance, by which it may more easily permeat and enter in by the heat of the Sun; but by night mens bodies are more strong, and all things are more gross and dense. But you must observe a clean contrary course, if the malignity seem to borrow strength and celerity from coldness: But you must always 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 cause must be cut down in their season of the Moon, that is, in the decrease thereof.

Why the Moon is to be shunned.

After a little gentle walking in your Chamber, you must presently use some means that the principal parts may be strengthned by suscitating the heat and spirits, and that the passages to them may be filled, that so the way may be shut up from the infection coming from without. Such as by the use of garlick have not their heads troubled, nor their inward parts inflamed, as Country People and such as are used to it: to such there can be no more certain preservative and Antidote against the pestiferous fogs or mists, and the nocturnal obscurity, than to take it in the morning with a draught of good wine; for it being abundantly diffused presently over all the body, fills up the passages thereof, and strengthneth it in a moment.

Garlick good against the Plague.

For water; if the Plague proceed from the taintnre of the Air, we must wholly shun and avoid Rain-water, because it cannot but be infected by the contagion of the Air. Wherefore the water of Springs and of the deepest Wells are thought best. But if the malignity proceed from the vapors contained in the Earth, you must make choice of Rain-water. Yet it is more safe to digest every sort of water by boyling 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 takes the extremest mutation of heat and cold.

What water to be made choice of in the Plague time.

CHAP. VII.

Of the Cordial Remedies by which we may preserve our Bodies in fear of the Plague, and cure those already infected therewith.

SUch as cannot eat without much labour, exercise and hunger, and who are no lovers of Breakfasts, having evacuated their excrements, before they go from home must strengthen the heart with some Antidote against the virulency of the infection. Amongst which *Aqua Theriacalis*, or Treacle-water, two ounces, with the like quantity of Sack, is much commended being drunk, and rubbing the Nostrils, Mouth and Ears with the same; for the Treacle-water strengthens the heart, expels poyson, and is not only good for a preservative, but also to cure the disease it self: For by sweat it drives forth the poyson contained within. It should be made in *June*, at which time all simple medicines, by the vital heat of the Sun, are in their greatest efficacy.

Aqua Theriacalis good against the Plague both inwardly taken and outwardly applied.

The

The compoſition whereof is thus: Take the roots of *Gentian*, *Ciperus*, Tormentil, Diptam, *Fraxella* Elecampane, of each one ounce; the leaves of Mullet, *Carduus Benedictus*, Devils-bit, Burnet, Scabious, Sheeps-ſorrel, of each half a handful; of the tops of *Rue* a little quantity; of Myrtle-berries one ounce; of red Roſe-leaves, the flowers of Bugloſs, Borage and S. *Johns* wort, of each one ounce; let them be all cleanſed, dried and macerated for the ſpace of twenty four hours in one pound of white wine or Malmſie, and of Roſe-water or Sorrel-water; then let them be put in a veſſel of glaſs, and add thereto of Treacle and Mithridate, of each four ounces: then diſtill them in *Balneo Marie*, and let the diſtilled water be received in a Glaſs-Viol, and let there be added thereto of Saffron two drams, of Bole-Armenick, *Terra Sigillata*, yellow Sanders, ſhavings of Ivory and Harts-horn, of each half an ounce; then let the Glaſs be well ſtopped, and ſet in the Sun for the ſpace of eight or ten days. Let the preſcribed quantity be taken every morning ſo oft as ſhall be needful. It may be given without hurt to ſucking children, and to Women great with child. But that it may be the more pleaſant, it muſt be ſtrained through an Hippocras-bag, adding thereto ſome ſugar and cinnamon. The compoſition thereof.

Some think themſelves ſufficiently defended with a root of Elecampane, Zedoary, or Angelica, rowled in their mouth, or chawed between their teeth.

Others drink every morning one dram of the root of *Gentian* bruiſed, being macerated for the ſpace of one night in two ounces of white wine.

Others take Wormwood-wine.

Others ſup in a rear egg one dram of *Terra Sigillata*, or of Harts-horn, with a little Saffron, and drink two ounces of wine after it

There be ſome 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 diſtil it in *Balneo Marie*.

This Cordial water that followeth is of great vertue. Take of the roots of the long and round *Ariſtolochia*, Tormentil, Diptam, of each three drams, of Zedoary two drams, *Lignum Aloes*, yellow Sanders, of each one dram, of the leaves of Scordium, S. Johns-wort, 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, Maſtick, *Olibanum*, Bole-Armenick, *Terra Sigillata*, ſhavings of Harts-horn and Ivory, of each one ounce, of Saffron one ſcruple, of the Conſerves of Roſes, Bugloſs-flowers, water-lillies and old Treacle, of each one ounce, of Camphire half a dram, of *aqua vitæ* half a pint, of white wine two pints and a half; make thereof a diſtillation in *Balneo Marie*: The uſe of this diſtilled water is even as Treacle water is. A cordial water.

The electuary following is very 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 powder of the electuary *de gemmis* and *Diamargariton frigidum*, the powder of Harts-horn, and red Coral, of each one dram: mix them with the ſyrup of the rinds and juice of Pome-Citrons as much as ſhall ſuffice, and make thereof a liquid Electuary in the form of an Opiate, let them take every morning the quantity of a Filberd, drinking after it two drams of the water of Scabious, Cherries, *Carduus Benedictus*, and of ſome ſuch like cordial thing, or of ſtrong wine. A Cordial Electuary.

The following Opiate is alſo very profitable, which alſo may be made into tablets. Take of the roots of Angelica, Gentian, Zedoary, Elecampane, of each two drams; of Citron and Sorrel-ſeeds, of each half a dram; of the dried rinds of Citrons, Cinnamon, Bay and Juniper-berries, and Saffron, of each one ſcruple; of conſerve of Roſes and Bugloſs, of each one ounce; and fine hard Sugar 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 conſerves of Bugloſs and *Mel Anthoſatum*, and ſo adding all the reſt dry and in powder. An Opiate.

Or take of the roots of Valerian, Tormentil, Diptam, of the leaves of Rue, of each half an ounce; of Saffron, Mace, Nutmegs, of each half a dram; of Bole-Armenick prepared half an ounce; of conſerve of Roſes and ſyrup of Limons, as much as will be ſufficient to make thereof an Opiate liquid enough. Anocher.

Or take of the roots of both the *Ariſtolochiaes*, of Gentian, Tormentil, Diptam, of each one dram and a half; of Ginger three drams; of the leaves of Rue, Sage, Mints and Penny-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 aloes*, and yellow Sanders, of each one dram; of Male-Frankincenſe, *i. Olibanum*, Maſtich, ſhavings of Harts-horn and Ivory, of each two ſcruples: of Saffron half a dram; of Bole-Armenick, *Terra Sigillata*, red Coral, Pearl, of each one dram; of conſerves of Roſes, Bugloſs-flowers, water-lillies and old Treacle, of each one ounce; of Loaf-ſugar one pound and a quarter: a little before the end of the making 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. Another.

Treacle and Mithridate faithfully compounded, excel all Cordial medicines, adding for every half ounce of them, one ounce and an half of Conſerves of Roſes, or of Bugloſs, or of Violets, and three drams of Bole-Armenick prepared: Of theſe being mixt with ſtirring, and incorporated together, make a conſerve: it muſt be taken in the morning the quantity of a Filberd. You muſt chuſe that treacle that is not leſs than four years old, nor above twelve: that which is ſomewhat new, is judged to be moſt meet for cholerick perſons; but that which is old, for phlegmatick and old men. For at the beginning the ſtrength of the *Opium* that enters into the compoſition thereof, remains in its full vertue for a year: but afterwards the more years old it waxeth, the ſtrength thereof is more aboliſhed, ſo that at length the whole compoſition becometh very hot.

The confection of *Alkermes* is very effectual both for a preſervative againſt this diſeaſe, and alſo for the cure.

The quantity of a Filberd of Rubarb, with one Clove chawed or rowled in the mouth, is ſuppoſed

to repel the coming of the peſtilent air: as alſo this compoſition following.

A Confection to be taken in the morning againſt the peſtilent Air.

Take of preſerved Citron and Orange pills, of each one dram; of *conſerve* of Roſes, and of the roots of Bugloſs, of each three drams; of Citron-ſeeds half an ounce; of Anniſe-ſeeds and Fennel-ſeeds, of each one dram; of Angelica-Roots four ſcruples; ſugar of Roſes as much as ſufficeth; Make a Confection, and cover it with leaves of Gold, to take a little of it upon a ſpoon before you go abroad every morning.

A March-pane

Or take of Pine-apple-kernels, and Piſtick-nuts, infuſed for the ſpace of ſix hours in the 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 a half: of Angelica-roots four ſcruples: make them according to art, unto the form of March-pane, or of any 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-Armeniek*, *Terra Sigillata*, of each one ſcruple; Camphire, Cinnamon, Sorrel-ſeeds, and Zedoary of each one ſcruple, of the *ſpecies* of the electuary *Diamargariton frigidum*, two ſcruples; of *conſerve* of Roſes, Bugloſs preſerved, Citron-pills, Mithridate, Treacle of each one dram; of fine Sugar diſſolved in *Scabious* and *Cardnus*-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 he never knew any to be infected that uſed them: the compoſition of them is thus.

Take of the beſt Aloes half a dram, of *Gum-Ammoniacum* two drams, of Myrrh two drams and an half, of Maſtich two drams, of Saffron 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 be kept in leather: Let the patient take the weight of half a dram every 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 malignity or putrefaction: For experience hath taught us, that Sorrel being 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, Aloes doth cleanſe and purge, Myrrh reſiſts putrefaction, Maſtich ſtrengthens, Saffron exhilarates and makes lively the ſpirits that govern the body, eſpecially the vital and animal.

Other pills.

Thoſe pills that follow are alſo much approved. Take of Aloes 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 a 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 be uſed as aforeſaid.

If the maſs begin to wax hard, the pills that muſt preſently be taken, muſt be mollified with the ſyrup of Limons.

Other pills.

Take of waſhed Aloes two ounces, of Saffron one dram, of Myrrh half an ounce, of *Ammoniacum* diſſolved in white wine one ounce, of hony of Roſes, Zedoary, red Sanders, of each one dram, of *Bole-Armeniek* prepared two drams, of red coral half an ounce, of Camphire half a ſcruple: make thereof pills according to art. But thoſe that are ſubject or apt to the hemorrhoids ought not at all, or very ſeldom to uſe thoſe kinds of pills that do receive much Aloes.

They ſay, that King *Mithridates* affirmed by his own writing, that whoſoever took the quantity of an hazel-nut of the preſervative following, and drank a little wine after it, ſhould be free from poyſon that day, Take two Wall-nuts, thoſe that be very dry, two Figs, twenty leaves of *Rue*, and three grains of ſalt: beat them and incorporate them together, and let them be uſed as is aforeſaid.

This remedy is alſo ſaid to be profitable for thoſe that are bitten or ſtung by ſome venomous beaſt, and for this only, becauſe it hath *Rue* in the compoſition thereof. But you muſt forbid women that are with child the uſe of this medicine; for *Rue* is hot and dry 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 child. Of ſuch variety of medicines, every one may make choice of that is moſt agreeable to his taſte, and as much thereof as ſhall be ſufficient.

CHAP. VIII.

Of local medicines to be applied outwardly.

THoſe medicines that have proper and excellent vertues againſt the peſtilence, are not to be neglected to be applied outwardly, or carried in the hand. And ſuch are all aromatical, aſtringent, or ſpirituous things, which therefore are endued with vertue to repel the venomous and peſtiferous air, from coming and entring into the body, and to ſtrengthen the heart and brain. Of this kind are *Rue*, Balm, Roſemary, *Scordium*, *Sage*, Worm-wood, Cloves, Nutmegs, Saffron, the roots of Angelica, and Lovage, and ſuch like, which muſt be macerated one night in ſharp Vinegar and *Aqua vitæ*, and then tied in a knot as big as an egg, or rather let it be 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, than a ſponge. Wherefore it is of principal uſe either to keep or hold ſweet things to the noſe, or to apply Epithems and fomentations to the heart.

Of what nature the medicines outwardly uſed ought to be.

Thoſe ſweet things ought to be hot or cold, as the ſeaſon of the year, and kind 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 vinegar of Roſes, and Roſe-water, into which you muſt dip a ſponge, which rowled in a fair linnen cloth, you may carry in your hand, and often ſmell to.

Take

Take of Worm-wood half a handful; ten Cloves, of the roots of *Gentian* and Angelica, of each two drams; of vinegar and Rosewater, of each two ounces; of Treacle and Mithridate, of each one dram; beat and mix them well all together, and let a sponge be dipped therein, and used as above said. They may also be inclosed 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 be carried than Pomanders: the form of which is thus: Take of yellow Sanders, *Mace*, Citron-pills, Rose and Myrtle-leaves, 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 scruple; of Musk three grains. Make thereof a Pomander, with Rose-water, with the infusion of Tragacanth. Or take red-Rose-leaves, 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 be made into powder, and with Water of Roses and Tragacanth make a pomander. Pomanders.

In the Winter it is to be 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-Greece, 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 carry about with you sweet powders, made of Amber-Greece, *Storax*, Orris, Nutmegs, Cinnamon, *Mace*, Cloves, Saffron, Benzoin, Musk, Camphire, Roses, Violets, *Juncus odoratus*, Marjoram, and such like, of which being mixed together, Powders may be 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-leaves, white Sanders, *Storax*, of each one dram; of *Cyperus* one ounce; of *Calamus aromaticus*, one ounce; of Marjoram, 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 dram: Make thereof a fine powder, and sow it in a bag.

It will be very convenient also to apply 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 vinegar and Rose-water in Summer, and with strong wine and Muskadine in the Winter. Bags.

The sweet Aromatick things that are so full of spirits, smelling sweetly and strongly, have admirable vertues to strengthen the principal parts of the body, and to stir up the expulsive faculty to expel the poyson.

Contrariwise, those that are stinking and unsavory, procure a desire to vomit, and dissolution of the powers, by which it is manifest how foolish and absurd their perswasion is, that counsel such as are in a pestilent constitution of the Air, to receive and take in the stinking and unsavoury vapours of *sinks* and *privies*, and that especially in the morning. Unsavory things to be eschewed.

But it will not suffice to carry those preservatives alone, without the use of any other thing, but it will be also very profitable to wash all the whole body in Vinegar of the decoction of Juniper and Bay-berries, the Roots of *Gentian*, Marigolds, S. Johns-Wort, and such like, with Treacle or Mithridate also dissolved in it. For vinegar is an enemy to all poysons in general, whether they be hot or cold: for it resisteth and hindereth putrefaction. Neither is it to be feared, that it should obstruct the pores, by reason of its coldness, if the body be 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 body therewith, let him wash only his armholes, the *region* of his heart, his *temples*, groins, parts of generation; as having great and marvelous sympathy with the principal and noble parts.

If any mislike bathing, let him anoint himself with the following Unguent. Take oyl of Roses, four ounces; oyl 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 oyl of Mastich, of *Sage*, or of Cloves, and such like, into the ears, with a little Civet or Musk.

CHAP. IX.

Of other things to be observed for prevention in fear of the Plague.

VEnery is chiefly to be eschewed, for by it the powers are debilitated, the spirits dissipated, and the breathing places of the body diminished, and lastly, all the strength of nature weakned. A sedentary life is to be shunned, as also excess in diet, for hence proceeds obstruction, the corruption of the juices, and preparation of the body to putrefaction and the pestilence. Why Venery is to be shunned.

Women must be very 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 society. Such as have fistulaes, or otherwise old ulcers, must not heal them up in a pestilent season; for it is then more convenient rather to make new ones and these in convenient and declining places; that as by these channels, the sink of the humors of the body may be emptied. Running ulcers good in time of pestilence.

The Hemorrhoids, bleedings, and other the like accustomed evacuations, must not be stopped, unless

less they exceed measure. Moreover, they must at such times take heed that they touch or handle not any of those things wherein the seeds or fuel of the pestilence may lie hid; such as are hemp, flax, quilts and coverings wherein such as have had the plague have lain; skins and all leather things, hangings and cloaths. You must dwell far from Church-yards, especially from those wherein the corps of such as have died of the plague are not buried deep in the ground, as in the Church of *Innocents* in *Paris*, in which place by the same reason it sundry times happens 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, diers, tallow-chandlers, cloth-dressers, farriers, skinners, and from the places wherein metals are cast or wrought. The filth and dung, especially of Swine, Privies, standing and muddy waters, and lastly all things of the like evil smell, must be far remote from your habitation; the belly must not be emptied into those places, into which the excrements of such as have the plague are cast. The company of such as usually visit those sick of the plague, must be eschewed, as of Physicians, Apothecaries, Surgeons, Nurse-keepers, Grave-makers, and Bearers: For though they have not the plague, yet coming out of a pestilent place, they may carry with them lying in their garments, the seeds thereof. You may gather this by such as have for a little while stayed in a perfumers shop, for the perfume diffused in the air, bestows the smell upon the garments of such persons, so that gone from thence, such as meet them, will judg them to carry perfumes with them. They shall also shun long watchings, sound sleeping, all passions of the mind, especially, anger, hunger, thirst, journying in the Sun, for that hath oft times occasioned a diary feaver, which hath not seldom been seen to turn into a pestilent one: for by dilating the pores 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.

Places to be shunned in time of plague

What company to be avoided.

You must do nothing in a pestilent season whereby you may grow too hot.

CHAP. X.

Of the Office of Magistrates in time of the Plague.

MAgistrates ought to have a special care that no filth be heaped up, either in private or publick places: let all things be kept neat in every house, and let all the streets be kept clean, the dung and filth be carried forth of the City, as also the dead carkasses of killed dogs and cats, for because they oft-times lick and devour the excrements of such as have the sickness, therefore they may by their familiar entry into sound houses, there propagate the plague: Wherefore they must either be driven forth of the City, or killed, and so be carried forth and buried deep in the ground. Wells, springs, and rivers themselves, must be freed and cleansed from all impurity. Care must be had that musty corn, tainted flesh, nor stinking fish be not set to sale. Publick baths and hot-houses must be prohibited, for that in these, mens bodies are weakned, and made more yielding and pervious to the pestiferous air. They shall commit the cure of such as have the plague, to learned, skilful and honest Physicians, Apothecaries and Surgeons.

Why dogs and cats must be killed in a Plague-time.

Why Baths and hot-houses are not then to be allowed.

Such as are known to have the Plague, shall be separated from such as are free there-from, and be sent to such fit places as shall be provided for them; for this is better and more humanely done than to shut up every man in his own house. They shall provide and fore-see that the houshold-stuff of such as have the plague be not set to sale. They shall set signs and noted marks upon the houses seized 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 be known by some conspicuous mark, that such as pass by them may be admonished of the danger; they shall also take care that the bodies of the dead be buried as speedily as may be. For they sooner and more grievously putrefie in a short time, than 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 tasting them they should quickly come to their deaths. The keepers of the gates of the City shall be admonished, that they take special care that such as are infected, or come from a visited place, do not enter into the City; for from one, the evil may come to spread it self further: for one spark may set a whole City on fire, and one scabby sheep infect a whole flock. And because there is nothing which may more perfectly purge the air, and cleanse it from all manner of noisomness and infection, than fire; they shall command that there be 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* tells, that the Souldiers of the Garrison of *Terny* used in a Plague-time, to discharge their Cannons laded only with powder, turning their mouths upon the City, and that morning and evening; that by the vehemency of the moved air, the pestiferous fogs might be chased away; and by the heat of the burned powder, the venenate and noisom quality of the air might be amended. Lastly, I judge it fit to admonish Magistrates, that they have their eyes and minds attentive upon a murderous and impious kind of Bearers and Nurse-keepers; which allured with a desire of gain (which whilst the Plague reigns, they get abundantly) anoint 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 family dispersed, they may there reign alone, and freely and without punishment carry thence what they please oft-times strangling such as lie ready to die, lest recovering, they might be their accusers. This I remember, happened at *Lions*, *Anno Dom.* 1565.

Lib. 2. de occult. nat. mirac.

The villany of some base people.

CHAP.

CHAP. XI.

What caution must be used in chusing Physicians, Apothecaries and Surgeons, who may have a care of such are taken with the Plague.

IT is the part of Magistrates in the so great necessity of the afflicted Common-wealth, to appoint learned, skilful and honest Physicians, Surgeons, and Apothecaries, and such as have more regard to the Law of God than 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 become free without examination or reward. But let them rather be allured by gifts and honest rewards, not only then when as necessity 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 worse and more dangerous to fall into the hands of such, than into the hands of thieves and murderers; for these by providence of strength, we may chance to escape; but we seek for and embrace the other, and having found them, lay our throats bare unto them, so by their unskilfulness to be butchered. Certainly by the fault of the times, and the neglect of Magistrates, it is almost come to this pass, that if any honest and learned Physicians and Surgeons shall undertake this cure, they are commonly forced thereto by the Magistrate, for fear of banishment or fining: Therefore because they do it against their wills, they shew themselves less vigilant, cheerful and painful about the sick. They come unwillingly, and compelled thereto, because by the memory 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 happens, that during the rest of their lives they may sit idle at home, for that they are infamous, and feared by the people only for this, that a while agon they visited such as had the Plague. Therefore I would have Magistrates prudent, faithful, and free in chusing 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 themselves.

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 he thinketh fit. Therefore they shall confidently enter into the cure thereof; for that our lot, life and death are in the hands of the Lord: but notwithstanding they ought not to neglect remedies, which are given to men for prevention, lest by the neglecting the gifts of God, they may seem to neglect him also that is the giver of so many good and excellent benefits. Therefore, first let them by purging and bleeding, evacuate the humors subject to putrefaction, and to conceive the seeds of the pestilence. Let them make two fontanels by application of cauterics, to be as rivulets to evacuate the excrementitious humors which are daily by little and little heaped up in us; let one of them be in the right arm a little below the muscle *Epomis*; the other the space of three fingers under the knee on the inside of the left leg. This is found by experience a very certain means of prevention. Let them wash their whole bodies with the following lotion. R. *aquæ ros. aceti rosati, aut sambucini, vini albi aut malvatici, an.* lb. vi. *rad. enulæ camp. angelicæ, gentian. bistortæ, zedoar. an.* ℥iii. *baccar. juniperi, & bederæ, an.* ℥ii. *salviæ, rorismar. absinth. rutæ, an.* m. j. *corticis citri,* ℥ β. *theriacæ & mithridat. an.* ℥j. *conquassanda conquassentur, bulliant lento igni, & serventur ad usum ante commemoratum.* The epithems, unguents and Bags formerly described shall be applied to the region of the heart. I have read it noted by *John Baptist Theodosius*, that amongst other things, Arsenick may be profitably applied tothe regi on of the heart, that so it may by little and little accustom it self to poysons, that afterwards it may be less harmed by their incursion, first making their assault upon it.

Our lots are in the hands of the Lord.

Where to make issues in the time of the Plague.

cap. 8.

Epist. 2.

Let their garments be made of Chamlet, Dutch Serge, Satin, Taffaty, or the like. Or else if they cannot of these, let them be of some other handsom Stuff, but not of Cloth, Freeze or the like, that they may take the venenate air, and carry it with them to the infection of the found. They shall oft-times change their cloaths, shirts and other linnen, and perfume them with aromatick things; let them warily approach the sick, more warily speak unto him, with their faces looking away from him rather than toward him, so that they may not receive the breath of his mouth, neither the vapour nor smell of any of his excrements.

What to wear.

How to visit your patient.

When as I upon a time being 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 he laid him bare, that so I might the better view a *Bubo*, that he had in his right groin, and two Carbuncles that were on his belly, then presently a thick, filthy and putrid vapour 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 senseless upon the ground; raised up a little after, all things seemed to me to run round, and I was ready to fall again, but that I stayed my self by taking hold of the bed-post. But one thing comforted me, 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 only dissipated by a venenate vapor, and that the substance of the heart was no way wronged, was a sneesing which took me so violently, that I sneesed ten times, and then fell a bleeding at the nose; which

An history.

which excretion, I believe, freed me from all the impreſſion of the malignity. Let others, warned by this mine example, learn to be wiſer and more wary in this caſe, leſt they come to worſe miſhap than befel me.

CHAP. XIII.

Of the ſigns of ſuch as are infected with the Plague.

Whence certain ſigns of the Plague may be taken.

WE muſt not ſtay ſo long before we pronounce one to have the Plague until there be pain and a tumor under his arm-holes, or in his groin, or ſpots (vulgarly called *Tokens*) appear over all the body, or Carbuncles ariſe: for many die through venenate malignity, before theſe ſigns appear. Wherefore the chiefeſt and trueſt ſigns of this diſeaſe are to be taken from the heart, being the manſion of life, which chiefly and firſt of all is wont to be aſſailed by the force of the poyſon. Therefore they that are infected with the Peſtilence, are vexed with often ſwoundings and faintings; their pulſe is feebler and ſlower than other, but ſometimes more frequent, but that is eſpecially in the night ſeaſon; they feel prickings over all their body, as if it were the pricking of needles; but their noſtrils do itch eſpecially by occaſion of the malign vapours ariſing upwards from the lower and inner, into the upper parts, their breaſt burneth, their heart beateth with pain under the left dug, difficulty of taking breath, ptiſſick, cough, pain of the heart, and ſuch an elation or puffing up of the *Hypochondria*, or ſides of the belly, diſtended with the abundance of vapours raiſed by the force of the feaveriſh heat, that the patient will in a manner ſeem to have the Tympany. They are moleſted with a deſire to vomit, and oftentimes with much and painful vomiting, wherein green and black matter is ſeen, and always of divers colours, anſwering in proportion to the excrements of the lower parts, the ſtomack being drawn into a conſent with the heat, by reaſon of the vicinity and communion of the veſſels; oftentimes blood alone, and that pure, is excluded and caſt up in vomiting; and is not only caſt up by vomiting out of the ſtomach, but alſo very often out of the noſtrils, fundament; and in women, out of the womb; the inward parts are often burned, and the outward parts are ſtiff with cold, the whole heat of the patient being drawn violently inward, after the manner of a Cupping-glaſs, by the ſtrong burning of the inner parts; then the eye-lids wax blew, as it were through ſome contuſion, all the whole face hath an horrid aſpect, and as it were the colour of lead, the eyes are burning red, and as it were ſwoln, or puffed up with blood, or any other humor, ſhed tears; and to conclude, the whole habit of the body is ſomewhat changed, and turned yellow.

The cauſe of vomiting in ſuch as have the Plague.

Their looks are ſuddenly changed.

Many have a burning feaver, which doth ſhew it ſelf by the patients ulcerated jaws, unquenchable thirſt, drineſs and blackneſs of the tongue and it cauſeth ſuch a phrenſie by inflaming the brain, that the patients, running naked out of their beds, ſeek to throw themſelves out of windows into the pits and rivers that are at hand. In ſome the joints of the body 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 feaver ſendeth up to the brain, the groſs vapors from the crude and cold humors, as it were from green woody newly kindled to make a fire.

Why ſome that are taken with the plague are ſleepy.

Such ſleeping doth hold him eſpecially while the matter of the ſore or carbuncle is drawn together, and beginneth to come 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 be ſharp that are ſtirred up unto the head, inſtead of ſleep they cauſe great waking, and always there is much diverſity of accidents, in the urine of thoſe that are infected with the Plague, by reaſon of the diverſe temperature and condition of bodies: neither is the urine at all times, and in all men of the ſame conſiſtence and colour: For ſometimes they are like unto the urine of thoſe that are found and in health, that is to ſay, laudable in colour and ſubſtance; becauſe that when the heart is affected by the venemous air, that entreth in unto it, the ſpirits are more greatly grieved and moleſted than 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 found.

But Urines only 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 me than theirs which ſay, that nature terrified with the malignities of the poyſon avoids contention, and doth not reſiſt or labour to digeſt the matter that cauſeth the diſeaſe.

Many have their appetites ſo overthrown, that they can abſtain from meat for the ſpace of three days together.

And to conclude, the variety of accidents is almoſt infinite, which appear and ſpring up in this kind of diſeaſe, by reaſon of the diverſity of the poyſon, and condition of the bodies and grieved parts: but they do not all appear in each man; but ſome in one, and ſome in another.

CHAP. XIV.

What ſigns in the Plague are mortal.

IT is a moſt deadly ſign in the Peſtilence, to have a continual and burning Feaver, to have the tongue dry, rough, and black, to breath with difficulty, and to draw in a great quantity of breath, but breath out little; to talk idly; to have Phrenſie and Madneſs together, with unquenchable thirſt and great watching; to have Convulſions, the Hicket, Heart-beating, and to ſwound very often and vehemently: further, toſſing and turning in the bed, with a loathing of meats, and dayly vomits of a green, black, and bloudy colour; and the face pale, black, of an horrid and cruel aſpect, bedewed with a cold ſweat, are very mortal ſigns.

There

There are some which at the very beginning have ulcerous and painful wearinesse, pricking under the skin, with great torment of pain; the eyes look cruelly and staringly, the voice waxeth hoarse, the tongue rough and stutting, and the understanding decaying the patient uttereth and talketh of frivolous things. Truly those are very dangerously sick, no otherwise than those whose urine is pale, black, and troubled like unto the urine of carriage-beasts, or lee, with divers coloured clouds or contents; as blew, green, black, fatty and oily, as also resembling in shew, a Spiders web, with a round body swimming on the top. An ulcerous and painful wearinesse from the beginning sheweth the Plague to be deadly.

If the flesh of the carbuncle be dry and black, as it were seared with an hot iron, if the flesh about it be black and blew, if the matter do flow back, and turn in, if they have a lask with greatly stinking, liquid, thin, clammy, 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 eyes wax often dim, if the nostrils be contracted or drawn together, if they have a grievous cramp, the mouth be drawn aside, the muscles of the face being drawn or contracted equally or unequally; if the nails be black; if they be often troubled with the Hicket, or have a Convulsion and resolution over all the body, then you may certainly prognosticate that death is at hand, and you may use cordial medicines only, but it is too late to purge, or let bloud.

CHAP. XV.

Signs of the Plague coming by contagion of the air without any fault of the humors.

YOu shall understand, that the Pestilence proceeds from the corruption of the air, if it be very contagious, and dispersеth it self into sundry places in a moment. If it kill quickly and many, so that whilst sundry 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 any pain oppressing them; for the malignity of the corrupt air is quick and very speedy in infecting our spirits, overthrowing the strength of the heart, and killing the Patient. The Patients are not troubled with great agitation, because the spirits dissipated by the rapid malignity of the poyson, cannot endure that labour; besides they are taken with frequent swoundings, few of them have Buboes, few have Blains come 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 body by the fault and putrefaction of humors.

FOrmerly we have reckoned up the causes of the corruption of humors from plenitude, obstruction, distemper, and the ill juice of meats. Now must we deliver the signs of each corrupt humor which reigns in us, that it may be reduced to soundnesse and perfection of nature, by the opposition of its contrary, or else be evacuated by Physick. Therefore if the body be more yellow than usual, it is a sign of choler offending in quantity and quality. If more black, then of melancholy; if more pale, then of phlegm; if more red, with the veins swoln up and full, then of blood. Also the colour of the rising blains, tumors and spots, expresse the colour of the predominant humor, as also the excrements cast forth by vomit, stool, and otherwise; the heavinesse and cheerfulnesse of the affected body; the manner of the present Feaver; the time of the year, age, region, diet. Such things as have a cutting, penetrating, attenuating, and cleansing faculty, take away obstruction. By means of obstruction, Feavers oft-times accompany the Plague, and these not only continual, but also intermitting, like tertians or quartans. Therefore that Plague that is fixed in the infection or corruption of a cholerick humor, shews it self by the forementioned signs of predominating choler, to wit, the heat of the skin, blains, and excrements; as also in the quicknesse of killing, and vehemency of the symptoms, bitternesse of the mouth, a painful and continual endeavour of going to stool, by reason of the acrimony of choler stimulating and raking the guts in the passage forth. That which resides in the corrupt substance of grosse humors, as of bloud, sheweth it self by many and plentiful sweats, by a scouring, by which are avoided many and various humors; and oft-times also bloudy matter that proceeds from corrupt phlegm, it invades with more sound sleep, and causelesse wearinesse 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 being obstructed by the grosnesse of the humors. That which is seated in the corruption of a melancholick humor, is accompanied with heavinesse and pain of the head, much pensivenesse, a deep and small pulse. But the most certain sign of the Plague residing in the corruption of the humors, is to be taken from the urine. For the signs of the vitiated humors cannot but shew themselves 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 some are much troubled with thirst, others not at all; because choler or phlegm sometimes only putrifie in the stomach or orifice of the ventricle; sometimes besides, they will weaken the government of the natural faculties of the part, as of the appetite. But if the Feaver happen by the default and infection both of the air and humors; then will there be a great confusion of the forementioned signs and symptoms. Signs of choler. When the urine is to be looked upon. Why some are much troubled with thirst, others not at all.

CHAP.

CHAP. XVII.

Of the Prognostication that is to be instituted in the Plague.

No certain prediction in the Plague.

You may well fore-tell the future motions and events of diseases, when you throughly know the nature of the disease, and accidents thereof, and the condition, function, and excellency of the body and grieved parts: Although that this may be spoken in general, that there is no certain prediction in pestilent diseases, either to health or death, for they have very unconstant motions, sometimes swift and quick, sometimes slow, and sometimes choaking or suffocating in a moment, while one breaths in the venomous air, as he is going about any of his necessary affairs, having pustles rising in the skin with sharp pain, and as though the whole body was pricked all over with needles or the stings of Bees. Which I have seen with mine eyes in the Plague that was at *Lions* when *Charles* the French King lay there. It many times cometh to pass that the accidents that were very vehement and raging a little before, are suddenly aswaged, and the patients do think themselves better, or almost perfectly sound. Which happens to *Mary* one of the Queen-mother her maids, in that notable pestilent constitution of the air, that year when *Charles* the French King lay at the Castle of *Roussilion*: for when she 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, she said she was without any grief or disease at all, but that she was troubled with the difficulty of making water; and I think it was because the bladder was inflamed by the reflux of the matter; that she was found in mind and body, and walked up and down the chamber on the same day that she died. The strangeness of which thing made the King so fearful, that he hasted to depart thence.

An history.

Why young men sooner take the plague than old.

Although this disease 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 than old men that are cold and dry, in whom the moisture, that is the nourisher of putrefaction by reason of their age, is consumed, and the ways, passages and pores of the skin, whereby the venomous air should enter and pierce in, are more strait and narrow. And moreover, because old men do always stay at home, but young men for their necessary business, and also for their delight and pleasure, are always more abroad in the day time, in the air, where-hence the pollution of the Pestilence cometh more often.

What Plague most contagious.

That pestilence that comes by the corruption of the humors, is not so contagious as that which cometh by the default of the air. But those that are Phlegmatick and Melancholick, are most commonly grieved with that kind of Pestilence; because in them the humors are more clammy and gross, and their bodies more cold and less perspirable, for which causes the humors sooner and more speedily putrefie.

Men that are of an ill juice, are also most apt to this kind of Pestilence, for in the naughty quality 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 an 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 cease or is almost at an end.

Who least subject to take the Plague.

But here also I would have you to understand those to be of an ill juice, which have no pores in their skin, by which, as it were by rivers, the evil juice which is contrary to nature, may be 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 are infected with the French-Pox, and have by reason thereof, tumors and rotten Ulcers, or have the Kings-evil running upon them, the Lepr sie or the Scab: and to conclude: all those that have Fistulaes and running in their bodies.

I think those that have quartane Feavers are the better priviledged for the same, because that by the fit causing sweat, that cometh every fourth day, they avoid much of the evil juice that was engendred.

This is more like to be true, than to think that the poyson that cometh from without, may be driven away by that which lurketh within.

Who subject thereto.

Contrariwise, women that are great with child, as I have noted, because they have much ill juice being prohibited from their accustomed evacuations, are very apt to take this disease, and so seldom recover after they are infected.

Signs the disease is incurable.

Black or blew impostumes, and spots and pustles of the same colour, dispersed over the skin, argue that the disease is altogether incurable and mortal.

A good sign.

A deadly sign.

When the swelling or sore goeth or cometh before the Feaver, it is a good sign; for it declareth that the malignity is very weak and feeble, and that nature hath overcome it, which of it self is able to drive so great portion thereof from the inner parts. But if the sore or tumor come after the Feaver, it is a mortal and deadly sign, for it is certain that it cometh of the venomous matter not translated, but dispersed; not by the victory of nature, but through the multitude of the matter, with the weight whereof nature is overcome.

When the Moon decreaseth, those that are infected with the Pestilence, are in great doubt and danger of death, because 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 body is governed, become more weak and feeble, because of the imbecillity 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 commonly, at that time.

In a gross and cloudy air, the pestilent infection is less vehement and contagious, than in a thin and

and ſubtil air; whether that thinneſs of the air proceed from the heat of the Sun, or from the North wind and cold. Therefore at *Paris*, where naturally, and alſo through the abundance of filth that is about the City, the air is dark and groſs, the peſtilent infection is leſs fierce and contagious than it is in *Provence*, for the ſubtilty of the air ſtimulates or helps forward the Plague. In what air moſt contagious.

But this diſeaſe is mortal and pernicious whereſoever it be, becauſe 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 body: and yet you ſhall ſcarce find any man that thinketh of calling the Phyſician to help to preſerve him from ſo great a danger, before the ſigns thereof be evident to be 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 looked for? Therefore becauſe medicines come oft-times too late, and this malady is as it were a ſudden and winged meſſenger of our death, it cometh to paſs, that ſo many die thereof. And moreover, becauſe of the firſt ſuſpicion of this ſo dire and cruel a diſeaſe, the imagination and mind (whoſe force in the diverſly much ſtirring up of the humors, is great and 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. What effects fear and confidence produce in the Plague.

This you may perceive and know, by reaſon that the keepers of ſuch as are ſick, and the bearers which are not fearful, but very confident, although they do all the baſeſt offices which may be for the ſick, are commonly not infected, and ſeldom die thereof, if infected.

CHAP. XVIII.

How a peſtilent Feaver comes to be bred in us.

THe Plague oft-times findeth fuel in our bodies, and oft-times allurements, to wit, the putrefaction of humors, or aptneſs to putrefie: but it never thence hath its firſt original, for that comes always from the defiled air; therefore a peſtilent Feaver is thus bred in us: The peſtilent air drawn by inſpiration in the lungs, and tranſpiration into the utmoſt mouths of the veins and arteries ſpread over the ſkin, the bloud or elſe the humors already putrefying or apt to putrefie therein, are infected or turned into a certain kind of malignity reſembling the nature of the agent. The original of the Plague always from the air.
Theſe humors, like unquencht 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 bloud boiling in the ventricles thereof, and therewith alſo the vital ſpirits; and hence proceeds a certain feaverish heat. This heat diffuſed over the body by the arteries, together with a malign quality, taints all, even the ſolid parts of the bones, with the peſtiferous venom; and beſides, cauſeth divers ſymptoms, according to the nature thereof, and the condition of the body and the humors wherein it is. Then is the conflict of the malignity aſſailing, and nature defending, manifeſt; in which, if nature prevail, it uſing the help of the expulſive faculty, 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 kinds of breakings out, over the ſkin, but on the contrary, if the malignity prevail, and nature be too weak, and yield, and that firſt he be 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 Feaver, if preſently at the firſt, with no labour, nor any evacuation worth the ſpeaking of, their ſtrength fail them, and they become exceeding faint. You may find the other ſigns mentioned in our preceeding diſcourſe. Signs that nature is orecome.

CHAP. XIX.

Into what place the Patient ought to betake himſelf ſo ſoon as he finds himſelf infected.

WE have ſaid, that the perpetual and firſt original of the peſtilence cometh of the Air; therefore ſo ſoon as one is blaſted with the peſtiferous Air, after he hath taken ſome preſervative againſt the malignity thereof, he muſt withdraw himſelf into ſome wholeſom Air, that is, clean and pure from any venomous infection or contagion; for there is great hope of health by the alteration of the Air; for we do moſt frequently and abundantly draw in the Air of all things, ſo that we cannot want it for a minute of time: therefore of the Air that is drawn in, dependeth the correction, amendment, or increaſe of the poyſon or malignity that is received, as the Air is pure, ſincere, or corrupted. Change of the Air conduceth to the cure of the Plague.

There be ſome 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 be open from whence that wind bloweth that is directly contrary unto that which brought in the venomous Air: For although there be no other cauſe, yet if the Air be not moved, or agitated, but ſhut up in a cloſe place, it will ſoon be 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 wind, or to procure Air with a thick and great cloth, dipped or macerated in water and vinegar mixed together, and tied to a long ſtaff, that by toſſing it up and down the cloſe chamber, the wind or air thereof may cool and recreate the Patient. The Patient muſt every day be carried into a freſh chamber, and the beds and the linnen cloaths muſt be changed: there muſt always be a clear and bright fire in the Patients chamber, and eſpecially in the night, whereby the air may be made more pure, clean, and void of nightly vapors, and of the filthy and peſtilent breath proceeding from the Patient, or his excrements. In the mean time, leſt (if it be in hot weather) the Patient ſhould be weakned or made more faint, by reaſon that the heat of the fire doth diſperſe and waſte his ſpirits, the floor or ground of his chamber muſt be ſprinkled or watered with vinegar and water, or ſtrowed with the branches Air pent up is apt to putrefie.

branches of Vines made moist in cold water, with the leaves and flowers of Water-lillies, or Poplar, or such like. In the fervent heat of Summer he must abstain from Fumigations that do smell too strongly, because that by assaulting the head, they increase the pain.

If the Patient could go to that cost, it were good to hang all the chamber where he lieth, and also the bed, with thick or coarse linnen cloaths moistned in vinegar and water of Roses. Those linnen cloaths ought not to be very white, but somewhat brown, because much and great whiteness doth disperse the sight, and by wasting the spirits, doth increase the pain of the head: for which cause also the chamber ought not to be very lightsome.

Contrariwise, on the night season there ought to be fires and perfumes made, which by their moderate light, may moderately call forth the spirits.

The materials for sweet fires.

Sweet fires may be made of little pieces of the wood of Juniper, Broom, Ash, Tamarisk, of the rind of Oranges, Limons, 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 way from the place where it is burnt. The virtue of the Ash-tree against venom is so great, as *Pliny* testifieth, that a Serpent will not come under the shadow thereof, no, not in the morning, nor evening, when the shadow of any thing is most great and long, but he will run from it. I my self have proved, that if a circle or compass be made with the boughs of an Ash-tree, and a fire made in the midst thereof, and a Serpent put within the compass of the boughs, that the Serpent will rather run into the fire than through the Ash-boughs.

Lib. 16. *cap.* 13.

There is also another means to correct the Air. You may sprinkle Vinegar of the decoction of Rue, Sage, Rosemary, Bay-berries, Juniper-berries, Cyprus-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 be perfumed with the vapor thereof.

Perfumes.

Also Fumigations may be made of some matter that is more gross and clammy, 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, Rosemary, and Marjoram, stamped together, and such like.

Sweet candles.

Those that are rich and wealthy, may have Candles and Fumes made of Wax, or Tallow mixed with some sweet things.

A sponge macerated in Vinegar of Roses, and Water of the same, and a little of the decoction of Cloves, and of Camphire added thereto, ought always to be ready at the Patients hand, that by often smelling unto it, the animal spirits may be recreated and strengthened.

A sweet water to smell to.

The water following is very effectual for this matter. Take of Orris four ounces, of Zedoary, Spikenard, of each six drams; of *Storax*, Benzoin, Cinnamon, Nutmegs, Cloves of each one ounce and half; of old Treacle, half an ounce: bruise them into gross powder, and macerate them for the space of twelve hours, in four pound of white and strong wine; then distil them in a Lembick of glass on hot ashes, and in that liquor wet a sponge, and then let it be tied in a linnen cloth, or closed in a box, and so often put into the nostrils. Or take of the vinegar and water of Roses, of each four ounces; of Camphire, six grains; of Treacle, half a dram, let them be dissolved together, and put into a viol 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-leaves, 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 Cyprus, half a dram; beat them into a gross powder, make thereof a *Nodula* between two pieces of Cambrick or Lawn of the bigness of an hand-ball; then let it be moistned in eight ounces of Rose-water, and two ounces of Rose-vinegar, and let the patient smell to it often. Those things must be varied according 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 Feavers 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 are made with a little Camphire and Cloves bruised and macerated together in Rose-water and vinegar of Roses, shall be sufficient.

CHAP. XX.

What Diet ought to be observed, and first of the choice of Meat.

Why such as have the Plague may feed more fully.

THe order of Diet in a pestilent disease ought to be cooling and drying; not slender, but some what full; because by this kind of disease there cometh wasting of the spirits, and exsolution of the faculties, which inferreth often swounding, therefore that loss must be repaired as soon as may be, with more quantity of meats that are of easie concoction and digestion; Therefore I never saw any being 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 clammy meats, and those which are altogether, and exquisitely of subtil parts, are to be avoided, for the sweet do easily take fire, and are soon inflamed; the moist will putrefie, the gross and clammy obstruct, and therefore engender putrefaction; those meats that are of subtil parts, over much attenuate the humors, and inflame them; and do stir up hot and sharp vapours into the brain, whereof cometh a Feaver. Therefore we must eschew Garlick and Onions, Mustard, salted and spiced Meats, and all kind of pulse must also be avoided, because they engender gross winds, which are the authors of obstruction: but the decoction of them is not always to be refused, because it is a provoker of urine. Therefore let this be their order of diet: let their bread be of Wheat or Barly, well wrought, well leavened and salted, neither too new, nor too stale: let them be fed with such meat as may be easily concocted and digested, and may engender

Pulse must be shunned.

The manner of Diet.

gender much laudable juice, and very little excremental, as are the flesh of Wether-Lambs, Kids, Leverets, Pullets, Partridges, Pigeons, Thrushes, Larks, Quails, Black-birds, Turtle-doves, Moor-Hens, Pheasants and such like; avoiding Water-Fowls. Let the flesh be moistned in Verjuice of unripe Grapes, Vinegar, or the juice of Limmons, Oranges, Citrons, tart Pomgranats, Barberies, Gooseberries, or red Currans, or of Garden and Wild Sorrel: for all these sowre things are very wholsom in this kind of disease, for they do stir up the appetite, resist the venomous quality and putrefaction of the humours, restrain the heat of the Fever, and prohibit the corruption of the meats in the stomach. Although those that have a more weak stomach, and are indued with a more exact sense, and are subject to the Cough and diseases of the Lungs, must not use these, unless they be mixed with Sugar and Cinamon.

If the Patient at any time be fed with sodden meats, let the broths be made with Lettuce, Purslain, Succory, Borage, Sorrel, Hops, Buglos, Cresses, Burnet, Marigolds, Chervil, the cooling Seeds, French-Barly, and Oat-meal, with a little Saffron, for Saffron doth engender many spirits, and resisteth poison. To these opening roots may be added, to avoid obstruction; yet much broth must be 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 be seasoned with overmuch Oil and Salt, that they may also with good success be put into broths.

Fishes are altogether to be avoided, because they soon corrupt in the stomach: but if the Patient be delighted with them, those that live in stony places must be chosen; that is to say, those that live in pure and sandy water, and about Rocks and Stones, as are Trouts, Pikes, Pearches, Gudgeons and Crevices boiled in milk, Wilks, and such like. And concerning Sea-fish, he may be fed with Gilthead, Gurnarts, with all the kinds of Cod-fish, Whitings not seasoned with salt, and Turbuts.

Eggs potched and eaten with the juice of Sorrel are very good. Likewise Barly-water seasoned with the grains of a tart Pomgranat, and if the Fever be vehement, with the seeds of white Poppy. Such Barly-water is easie to be concocted and digested, it cleanseth greatly and moistens and mollifieth the belly. But in some it procures an appetite to vomit, and pain of the head, and those must abstain from it. But in stead of Barly-water they may use Pap, and Bread crummed in the decoction of a Capon.

For the second Course let him have Raisins of the Sun newly sodden in Rose-water with Sugar, sowre Damask Prunes, tart Cherries, Pippins, and Catharine Pears. For the second Course.

And in the latter end of the Meal, Quinces roasted in the Embers, Marmalate of Quinces, and Conserves of Buglos or of Roses, and such like, may be taken: or else this Powder following. In the end of the Meal.

Take of Coriander-seeds prepared two drams, of Pearl, of Rose-leaves, Shavings of Harts-horn and Ivory of each half a dram, of Amber two scruples, of Cinamon one scruple, of Unicorns horn, and the bone of a Stags heart of each half a scruple, of Sugar of Roses four ounces: make thereof a Powder, and use it after meats.

If the Patient be somewhat weak, he must be fed with Gelly made of the flesh of a Capon, and Veal sodden together in the water of Sorrel, *Cardans Benedictus*, with a little quantity of Rose Vinegar, Cinamon, Sugar, and other such like, as the present necessity shall seem to require.

In the night season for all events and mischances, the Patient must have ready prepared, broth of meats of good digestion, with a little of the juice of Citrons or Pomgranats.

This restaurative that followeth may serve for all. Take of the Conserve of Buglos, Borage, Violets, Water-lillies, and Succory, of each two ounces, of the powder of the Electuary *Diamargaritum frigidum*, of the Trochisces of Camphire of each three drams, of Citron-seeds, *Cardans*-seeds, Sorrel-seeds, the Roots of *Dictamnus*, Tormentil, of each two drams, of the broth of a young Capon, made with Lettuce, Purslain, Buglos and Borage boiled in it, six pints, put them in a Limbeck of glass with the flesh of two Pullets, of so many Partridges, and with fifteen leaves of pure Gold: make thereof a distillation over a soft fire. Then take of the distilled liquor half a pint, strain it through a woollen bag, with two ounces of white Sugar, and half a dram of Cinamon: let the Patient use this when he is thirsty. Or else put the flesh of one old Capon, and of a leg of Veal, two minced Partridges, and two drams of whole Cinamon without any 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 be boiled in their own juice, without any hurt of the fire; then let the juice be pressed out therehence with a Press: give the Patient for every dose, one ounce of the juice with some cordial waters, some *Trisantalum* and *Diamargaritum frigidum*. A restaurative drink.

The Preserves of sweet fruits are to be avoided, because that sweet things turn into choler; but the Confection of tart Prunes, Cherries, and such like may be fitly used. But because there is no kind of sickness that so weakens the strength as the Plague, it is always necessary, but yet sparingly and often to feed the Patient, still having respect unto his custom, age, the region, and the time: for through emptiness there is no great danger, lest that the venomous matter that is driven out to the superficial parts of the body, should be called back into the inward parts, by an hungry stomach, and the stomach it self should be filled with cholerick, hot, thin, and sharp excremental humours, whereof cometh biting of the stomach, and gripings in the guts.

CHAP. VII.

What drink the Patient infected ought to use.

IF the Fever be great and burning, the Patient must abstain from Wine, unless he be subject to swouning: and he may drink the *Oxymel* following in stead thereof.

An Oxymel. Take of fair Water three quarts, wherein boil four ounces of Honey until the third part be consumed, scumming it continually; then strain it, and put it into a clean vessel, and add thereto four ounces of Vinegar, and as much Cinnamon as will suffice to give it a taste. Or else a sugred Water, as followeth. Take two quarts of fair Water, of hard Sugar six ounces, of Cinamon two ounces; strain it through a woollen bag or cloth without any 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.

A Julip. The use of the Julip following is also very wholsom. Take of the juice of Sorrel well clarified half a pint, 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 and clarified, adding a little before the end a little Vinegar, 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 former described Julip strained and clarified four ounces; let it be 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 be given the Patient to drink with the juice of Citrons.

Those that have been accustomed to drink Sider, Perry, Beer or Ale, ought to use that drink still, so that it be clear, transparent and thin, and made of those fruits that are somewhat tart; for troubled and dreggish drink doth not onely engender gross humours, but also crudities, windiness, and obstructions of the first region of the body, whereof comes a Fever.

The commodities of Oxycrate. To whom hurtful. Oxycrate being given in manner following, doth assuage the heat of the Fever, and repress the putrefaction of the humours, and the fierceness of the venom, and also expelleth the Water through the Veins, if so be that the Patients are not troubled with spitting of bloud, cough, yexing, and altogether weak of stomach, for such must avoid tart things.

Take of fair Water one quart, of white or red Vinegar 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 Limmons and Citrons, of each half an ounce, of the juice of fowre 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 Currans of each one ounce, of the Water of Lillies four ounces, of fair Water boiled half a pint: make thereof a Julip. Or take of the Syrups of Water-lillies and Vinegar, of each half an ounce, dissolve it in five ounces of the Water of Sorrel, of fair Water one pint; make thereof a Julip.

The drinking of cold water, to whom, and when profitable. *Lib. 3. cap. 7.* But if the Patient be young, and have a strong and good stomach, and cholerick by nature, I think it not unmeet for him to drink a full and large draught of Fountain water, for that is effectual to restrain and quench the heat of the Fever; and contrariwise, they that drink cold water often, and a very small quantity at a time, as the Smith doth sprinkle Water on the Fire at his Forge, do increase the heat and burning, and thereby make it endure the longer. Therefore by the judgment of *Celsus*, when the disease is in the chief increase, and the Patient hath endured thirst for the space of three or four days, cold water must be given unto him in great quantity, so that he may drink past his satiety, that when his belly and stomach are filled beyond measure, and sufficiently cooled he may vomit.

Some do not drink so much thereof as may cause them to vomit, but do drink even unto satiety, and so use it for a cooling Medicin; but when either of these is done, the Patient must be covered with many cloths, and so placed that he may sleep; and for the most part after long thirst and watching, and after long fulness, and long and great heat, found sleep cometh; by which great sweat is sent out, and that is a present help.

But thirst must sometimes be quenched with little pieces of Melons, Gourds, Cucumers, with the leaves 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 be aged, his strength weak, phlegmatick by nature, and given to Wine, when the state of the Fever is somewhat past, and the chief heat beginning to assuage, he may drink Wine very much allaid at his meat, for to restore his strength, and to supply the want of the wasted spirits. The Patient ought not by any means to suffer great thirst, but must mitigate it by drinking, or else allay it by washing his mouth with oxycrate and such like; and he may therein also wash his hands and his face, for that doth recreate the strength. If the flux or lask trouble him, he may very well use to drink steeled Water, and also boiled milk wherein many stones coming red hot out of the fire have been many times quenched. For the driness and roughness of the mouth, it is very good to have a cooling, moistening, and lenifying lotion of the mucilaginous water of the infusion of the seeds of Quinces, *Psilium, id est*, Flea-wort, adding thereto a little Camphire, with the Water of Plantain and Roses, then cleanse and wipe out the filth, and then moisten the mouth by holding therein a little Oil of sweet Almonds mixed with a little Syrup of Violets. If the roughness breed or degenerate into Ulcers, they must be touched with the Water of the infusion of *sublimate*, or *Aqua fortis*.

For drineſs or roughneſs of the mouth.

For the Ulcers thereof.

But because we have formerly made frequent mention of drinking of Water, I have here thought good to speak somewhat of the choice and goodness of Waters. The choice of Water is not to be neglected,

neglected, because a great part of our diet depends thereon; for besides that we use it either alone or mixed with Wine for drink, we also knead bread, boil meat, and make broths therewith. Many 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 runs out of the tops of Mountains, through Rocks, Cliffs, and Stones: in the third place they put Well-water, or that which riseth from the foots of Hills. Also the River-water is good, that is taken out of the midst or stream. Lake or Pond-water is the worst, especially if it stand still, for such is fruitful of and stored with many venemous Creatures, as Snakes, Toads, and the like. That which comes by the melting of Snow and Ice is very ill, by reason of the too refrigerating faculty and earthly nature. But of Spring and Well-waters these are to be 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 Pulse, 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 lively and fresh colour in their faces.

The choice of Waters.

Hip. sect. 5. Aph. 26.

CHAP. XXII.

Of Antidotes to be used in the Plague.

NOw we must treat of the proper cure of this disease, which must be used as soon as may be possible, because this kind of poison, in swiftness exceedeth the celerity of the Medicin. Therefore it is better to err in this, that you should think every disease to be pestilent in a pestilent season, and to cure it as the Pestilence: because that so long as the Air is polluted with the seeds of the Pestilence, the humours in the body are soon infected with the vicinity 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.

Many begin the cure with Bloud-letting, some with Purging, and some with Antidotes. We taking a consideration of the substance of that part that is assaulted, first of all begin the cure with an Antidote; because that by its specifick property it defends the heart from poison, as much as it is offended therewith. Although there are also other Antidotes which preserve and keep the heart and the Patient from the danger of Poison and the Pestilence, not only because they do infringe the power of the poison in their whole substance, but also because they drive and expel it out of all the body by sweat, vomiting, scouring, and such other kinds of evacuations.

The beginning of the cure must be by Antidotes.

The Antidote must be given in such a quantity as may be sufficient to overcome the poison; but because it is not good to use it in greater quantity than needeth, lest it should overthrow our Nature, for whose preservation onely it is used; therefore that which cannot be taken together at once, must be taken at several times, that some portion thereof may daily be used so long, until all the accidents, effects and impressions of the poison be past; and that there be nothing to be feared. Some of those Antidotes consist of portions of venemous things being tempered together, and mixed in an apt proportion with other Medicins whose power is contrary to the venom: as Treacle, which hath for an ingredient the flesh of Vipers, that it being thereto mixed may serve as a guide to bring all the Antidote unto the place where the venenate malignity hath made the chief impression, because by the similitude of Nature and Sympathy, 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 excell all other Antidotes, for by strengthening the noblest part, and the mansion of life, they repair and recreate the wasted spirits, and overcome the poison, not onely being taken inwardly, but also applied outwardly to the region of the heart, Botches and Carbuncles: for by an hidden property 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 deadly force; as it is declared at large by *Galen*, in his Book *De Theriaca ad Pisonem*, by most true reasons and experiment. 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 giving of Treacle, I would not altogether seem to neglect the Fever, but think it good to minister or apply it mixed with cordial-cooling Medicins, as with the Trochisces of Camphire, Syrup of Limmons, of Water-lillies, the Water of Sorrel and such like. And for the same cause we 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.

In what quantity they must be taken.

Why poysonous things are put into Antidotes.

Some poisons Antidotes to other some.

The Patient ought to walk presently after he hath taken Treacle, Mithridate, or any other Antidote, but yet as moderately as he can: not like unto many, which when they perceive themselves to be infected, do not cease to course and run up and down, until they have no strength to sustain their bodies; for so they dissolve Nature, so that it cannot suffice to overcome the contagion. After moderate walking the Patient must be put warm to bed, and covered with many 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 apply them to the groins and arm-holes, to provoke sweat: for sweating in this disease is a most excellent remedy, both for to evacuate the humours in the Fever, and also to drive forth the malignity in the Pestilence, although every sweat brings not forth the fruit of health. For *George Agricola* saith, that he saw a Woman at *Misnia* in *Germany*, that did sweat so for the space of three days, that the bloud came forth at her head and brest, and yet nevertheless she died.

How to walk after the taking of an Antidote.

This Potion following will provoke sweat. Take the roots of China shaved in thin pieces one ounce and half, of *Guaiacum* two ounces, of the bark of Tamarisk one ounce, of Angelica-roots two

A Sudorifick Potion.

two drams, of the ſhavings of Harts-horn one ounce, of Juniper-berries three drams: put them into a viol 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* until the half be conſumed, which will be done in the ſpace of ſix hours, then let them be ſtrained through a bag, and then ſtrained again, but let that be 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. The Powder following is alſo very profitable. Take of the leaves of *Dictamnus*, the Roots of Tormentil, Betony, of each half an ounce, of Bole-Armenick prepared one ounce, of *Terra Sigillata* three drams, of Aloes 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 wild Sorrel, and let the Patient walk ſo ſoon as he hath taken that Powder, then let him be laid in his bed to ſweat, as I have ſhewed before.

A Sudorifick Powder.

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 *Cardaus Benedictus*, Burnet, of each one handful; of Sorrel ſeeds, and Devils-bit, of each two pugils; of Ivy and Juniper-berries, of each half an ounce; of the Flowers of Bugloſs, Violets, and red Roſes, of each two pugils: Powder them ſomewat 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, diſtil them all in *Balneo Mariæ*, and keep the diſtilled liquor in a viol of glaſs well covered or cloſe ſtopped for your uſe: let the Patient take 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 very profitable for this purpoſe.

Another.

Alſo the Water following is greatly commended. Take of Sorrel ſix handfuls, of Rue one handful, dry them and macerate them in Vinegar for the ſpace of four and twenty hours, adding thereto four ounces of Treacle: make thereof a diſtillation in *Balneo Mariæ*, and let the diſtilled water be kept for your uſe: and ſo ſoon as the Patient doth think himſelf to be infected, let him take four ounces of that liquor, then let him walk and ſweat.

What means to be uſed in ſweating.

He muſt leave ſweating when he beginneth to wax faint and weak, or when the humour that runs down his body begins to wax cold, then his body muſt be wiped with warm cloths, 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 he muſt not ſleep when he is in his ſweat, leſt the malignity go inwardly with the heat and ſpirits unto the principal parts: but if the Patient be much inclined to ſleep, he muſt be kept from it with hard rubbing, and bands tied about the extreme parts of his body, and with much noiſe of them that are about him, and let his friends comfort him with the good hope that they have of his recovery; but if all this will not keep him from ſleep, diſſolve *Caſtoreum* in tart Vinegar, and *Aqua Vitæ*, and let it be injected into his noſtrils: and let him be kept continually waking 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 day and a night. In the mean time let the Phyſician that ſhall be preſent conſider all things by his ſtrength; for it is to be feared that great watchings will diſſolve 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 rind of a Preſerved Citron, Conſerve of Roſes, Bread toaſted and ſteeped in Wine, the meat of Preſerved Myrabolane, or ſome ſuch like thing.

CHAP. XXIII.

Of Epithemes to be uſed for the ſtrengthening of the principal parts.

Whereof they muſt be made

THere are alſo ſome topick Medicins to be reckoned amongſt Antidotes, which muſt be outwardly applied as ſpeedily as may be, as cordial and hepatick Epithems for the ſafety of the noble parts, and ſtrengthening of the faculties, as thoſe that drive the venenate air far from the bowels: they may be made of cordial things not onely hot, but alſo cold, that they may temper the heat, and more powerfully repercuſs. They muſt be applied warm with Scarlet, or a double linnen cloth, or a ſoft Sponge dipped in them, if ſo be that a Carbuncle do not poſſeſs the regions of the moſt noble parts: for it is not fit to uſe repercuſſives to a Carbuncle.

Repercuſſives not fit to be applied to Carbuncles.

You may make Epithems after the following forms: ℞ *Aquar. roſ. plantag. & ſolan. an.* ℥ iv. *aquæ acetoſ. vini granat. & aceti, an.* ℥ iij. *ſantal. rub. & coral. rub. pulveriſ. an.* ʒ iij. *theriac. vet.* ℥ ß. *camph.* ℈ j. *croci* ℈ j. *caryoph.* ʒ ß. *miſce, fiat epithema.* Or elſe, ℞ *Aq. roſ. & plantag. an.* ℥ x. *aceti roſ.* ℥ iv. *caryoph. ſant. rub. coral. rub. pulveriſ. pul. diamargarit. frigid. an.* ʒ j. ß. *camphoræ moſchi an.* ʒ j. *fiat epithema.* Or, ℞ *Aquar. roſar. & meliſſæ, an.* ℥ iv. *aceti roſ.* ℥ iij. *ſant. rub.* ʒ j. *caryophil.* ʒ ß. *croci* ℈ ij. *camphoræ* ℈ j. *boli arm. terræ ſigill. & zedoar. an.* ʒ j. *fiat epithema.* Or elſe, ℞ *Aceti roſ. & aquæ roſat. an.* ℔ ß. *camphoræ* ʒ ß. *theriac. & mithrid. an.* ʒ j. *fiat epithema.* Or elſe, *Aqu. roſar. nenuph. bugloſ. acetoſæ, aceti roſar. an.* ℔ ß. *ſant. rub. roſ. rub. an.* ʒ iij. *flor. nenuph. violar. camphor. an.* ʒ ß. *mithrid. & theriac. an.* ʒ ij. *teranter & miſceantur ſimul omnia.* When you intend to uſe them take ſome portion of them in a veſſel by its ſelf, wherewith let the affected bowel be fomented warm.

CHAP. XXIV.

Whether Purging and Bloud-letting be neceſſary in the beginning of Peſtilent diſeaſes.

Reaſons for and againſt Bloud-letting in the Plague.

SO ſoon as the heart is ſtrengthened and corroborated with Cordials and Antidotes, we muſt come to phlebotomy and purging. As concerning Bloud-letting in this caſe there is a great controverſie among Phyſicians. Thoſe that wiſh it to be uſed, ſay or affirm, that the

Peſtilent

peſtilent Fever doth infix it ſelf in the bloud, and therein alſo the Peſtilent malignity taketh its ſeat; and therefore it will ſoon infect the other humours, unleſs that the bloud be evacuated, and the infection that remaineth in the bloud be thereby taken away. Contrariwiſe, thoſe that do not allow phlebotomy in this caſe, alledge that it often cometh to paſs that the bloud is void of malignity, when the other humours are infected with the venemous contagion. If any man require my judgment in this doubtful queſtion, I ſay, that the peſtilence ſometimes doth depend on the default of the air: this default being drawn through the paſſages of the body, doth at length pierce unto the intrails, as we may underſtand by the abſceſſes which break out, one while behind the ears, ſometimes in the arm-holes, and ſometimes in the groins, as the brain, heart or liver are infected. And hereof alſo come Carbuncles, and other collections of matter, and eruptions, which are ſeen in all parts of the body; by reaſon that Nature uſing the ſtrength of the expulſive faculty, doth drive forth whatſoever is noiſom or hurtful. Therefore if the Phyſician will follow this motion of Nature, he muſt neither purge nor let bloud, leſt that by a contrary motion, that is, by drawing in from without, the motion of Nature which proceeds outwardly from within, ſhould be troubled. So we often ſee in thoſe who are purged or let bloud for ſuch Buboes as come through unlawful copulation, that the matter is thereby made contumacious, and by drawing it inwardly, it ſpeedily cauſeth the French Pox. The compoſing of this controverſie.

Wherefore when Buboes, Carbuncles, and other peſtilent eruptions appear, which come through the default of the air, we ought to abſtain from purging and phlebotomy; but it is ſufficient to forearm the heart inwardly and outwardly with Antidotes that are indued with a proper virtue of reſiſting the poiſon. For it is not to be doubted, but that when nature is debilitated with both kinds of evacuation, and when the ſpirits together with the bloud, are exhauſted, the venemous air will ſoon pierce, and be received into the empty body, where it exerciſeth its tyranny to the utter deſtruction thereof.

In the year of our Lord God 1566. in which year there was great mortality throughout all *France*, by reaſon of the Peſtilence and peſtilent diſeaſes, I earneſtly, and diligently inquired of all the Phyſicians and Chirurgions of all the Cities (through which King *Charles* IX. paſſed in his progreſs unto *Bayon*) what ſucceſs their Patients had after they were let bloud and purged: whereunto they all anſwered alike, that they had diligently obſerved, that all that were infected with the Peſtilence, and were let bleed ſome quantity of bloud, or had their bodies ſomewhat ſtrongly purged, thenceforwards waxed weaker and weaker, and ſo at length died; but others which were not let bloud nor purged, but took cordial Antidotes inwardly, and applied them outwardly, for the moſt part eſcaped and recovered their health: for that kind of Peſtilence took its original of the primitive and ſolitary default of the air, and not of the corruption of the humours. An Hiſtory.

The like event was noted in the hoarſneſs that we ſpoke of before; that is to ſay, that the Patients waxed worſe and worſe by purging and phlebotomy; but yet I do not diſallow either of thoſe remedies, if there be great fulneſs in the body, eſpecially in the beginning, and if the matter have a cruel violence, whereof may be feared the breaking in unto ſome noble part. For we know that it is confirmed by *Hippocrates*, that what diſeaſe ſoever is cauſed by repletion, muſt be cured by evacuation; and that in diſeaſes that are very ſharp, if the matter do ſwell, it ought to be remedied the ſame day, for delay in ſuch diſeaſes is dangerous; but ſuch diſeaſes are not cauſed or inflicted upon mans body by reaſon or occaſion of the peſtilence, but of the diſeaſed bodies, and diſeaſes themſelves commixed together with the peſtilence: therefore then peradventure it is lawful to purge ſtrongly, and to let a good quantity of bloud, 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 new and far greater ſtrength; eſpecially as *Celſus* admoniſheth us, where he ſaith, that by how much the ſooner thoſe ſudden invaſions do happen, by ſo much the ſooner remedies muſt be uſed, yea, or rather raſhly applied; therefore if the Veins ſwell, the face wax fiery red; if the arteries of the Temples beat ſtrongly; if the Patient can very hardly breath by reaſon of a weight in his ſtomach, if his ſpittle be bloudy, then ought he to be let bloud without delay, for the cauſes before mentioned. It ſeems beſt to open the Liver-vein on the left arm, whereby the heart and ſpleen may be better diſcharged of their abundant matter; yet bloud-letting is not good at all times, for it is not expedient when the body beginneth to wax ſtiff by reaſon of the coming of a Fever; for then by drawing back the heat and ſpirits inwardly, the outward parts being deſtitute of bloud, wax ſtiff and cold; therefore bloud cannot be let then without great loſs of the ſtrength, and perturbation of the humours. And it is to be noted, that when thoſe plethorick cauſes are preſent, there is one Indication of bloud-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, being joined with a vehement and ſtrong burning Fever, bloud muſt be letten by opening the Vein that is neareſt unto the tumour or ſwelling againſt nature, keeping the ſtraitneſs of the fibres, that this being open the bloud might be drawn more directly from the part affected; for all and every retraction of putrefied bloud unto the noble parts, is to be avoided, becauſe it is noiſom and hurtful to Nature, and to the Patient. Therefore for example ſake, admit the Patient be plethorick by repletion, which is called *ad Vaſa*, *id eſt*, unto the Veſſels, and *ad Vires*, *id eſt*, unto the ſtrength; and therewithall he hath a tumour that is peſtilent in the parts belonging unto the head or neck; the bloud muſt be 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 any other ſuch like cauſe, thoſe Veins do not appear in the arm, there be ſome that give counſel in ſuch a caſe to open the vein that is between the fore-finger and the thumb, the hand being put into warm water, whereby that Vein may ſwell and be filled with bloud gathered thither by means of the heat. When purging and bleeding may be uſed. *Aph.* 22. *ſect.* 2. *Aph.* 10. *ſect.* 4. *cap.* 7. *lib.* 3. Why bloud muſt be let on the left arm in the Plague.

If the tumour be under the harm-hole, or about thoſe places, the Liver-vein or the Median muſt be opened which runneth alongſt the hand: if it be in the groin, the vein of the ham, or *Sapbena*,

or any other vein above the foot that appeareth well, but always on the grieved side. And Phlebotomy must be performed before the third day: for this disease is of the kind or nature of sharp diseases, because that within four and twenty hours it runneth past help. In letting of bloud you must have consideration of the strength. You may perceive that the Patient is ready to swoun when that his forehead waxeth moist, with a small sweat suddenly arising by the aking or pain at the stomach, with an appetite to vomit, and desire to go to stool, gaping, blackness of the lips, and sudden alteration of the face unto paleness: and lastly most certainly by a small and slow pulse: and then you must lay your finger on the vein, and stop it until the Patient come to himself again, either by Nature, or else restored by Art; that is to say, by giving unto him Bread dipped in Wine, or any other such like thing: then if you have not taken bloud enough, you must let it go again, and bleed so much as the greatness of the disease, or the strength of the Patient will permit or require: which being done, some of the Antidotes that are prescribed before will be very profitable to be drunk, which may repair the strength, and infringe the force of the malignity.

CHAP. XXV.

Of purging Medicins in a Pestilent disease.

What Purges fit in the Plague.

IF you call to mind the proper Indications, purging shall seem necessary in this kind of disease, and that must be prescribed as the present case and necessity requireth; rightly considering that the disease is sudden, and doth require Medicins that may with all speed drive out of the body the hurtful humour wherein the noisom quality doth lurk and is hidden; which Medicins are divers by reason of the diversity of the kind of the humour, and the condition or temperature of the Patient. For this purpose six grains of Scammony beaten into Powder, or else ten grains are commonly ministred to the Patient with one dram of Treacle. Also Pills may be made in this form: Take of Treacle and Mithridate of each one dream, of *Sulphur vivum* finely powdered, half a dram, of *Diagridium* four grains; make Pills thereof. Or take three drams of Aloes, of Myrrh and Saffron of each one dram, of white Hellebore and *Asarabacca*, of each ℈ iv. make thereof a mass with old Treacle, and let the Patient take four scruples thereof for a dose, three hours before meat. *Ruffus* his Pills may be profitably given to those that are weak. The ancient Physicians have greatly commended Agarick for this disease, because it doth draw the noisom humours out of all the members: and the virtues thereof are like unto those of Treacle; for it is thought to strengthen the heart, and to draw out the malignity by purging. To those that are strong, the weight of two drams may be given, and to those that are more weak, half a dram. It is better to give the infusion in a decoction than in substance, for being elected and prepared truly into Trochisces, it may be called a divine kind of Medicin.

Pills.

Antimonium is highly praised by the experience of many, but because I know the use thereof is condemned by the Council and decree of the School of Physicians at *Paris*, I will here cease to speak of it.

Those Medicins that cause sweats are thought to excel all others, when the Pestilence cometh of the venemous air; among whom the efficacy of that which followeth, hath been proved, to the great good of many in that Pestilence which was lately throughout all *Germany*, as *Matthias Radler* Chancellour to Duke *George* the Count Palatine signified unto me by Letters.

An effectual sudorifick, and also purging Medicin.

They do take a bundle of Mugwort, and of the ashes thereof after it is burnt, they make a lee with four pints of Water, then they do set it over the fire, and boil it in a vessel of Earth well leaded, until the liquor be consumed, the earthy dregs falling into the bottom like unto salt, whereof they make Trochisces of the weight of a crown of gold: then they dissolve 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 he 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 he will vomit, and his belly will be loosed as if he had taken Antimony; and so they were all for the most part cured, especially all those that took that remedy betimes: and before the disease went to their heart, as I my self have proved in some that were sick at *Paris*, with most happy success. Truly Mugwort is most highly commended by the ancient Physicians, being taken and applied inwardly or outwardly, against the bitings of venemous Creatures, so that it is not to be doubted but that it hath great virtue against the Pestilence.

The virtues of Mugwort.

Vid. Rondelet. lib. 7. de pisc. c. 3.

I have heard it most certainly reported by *Gilbertus Heroaldus* Physician of *Mompelier*, that eight ounces of the pickle of Anchovies drunk at one draught, is a most certain and approved remedy against the Pestilence, as he and many other have often found by experience. For the Plague is no other thing but a very great putrefaction, for the correction and amendment whereof, there is nothing more apt or fit than this pickle or substance of Anchovies, being melted by the Sun and force of the salt that is strewed thereon. There be some which infuse one dram of Walwort seed in white Wine, and affirm that it drunk, will perform the like effect as Antimony. Others dissolve a little weight of the seed of *Rue* being bruised in Muskadine, with the quantity of a Bean of Treacle, and so drink it. Others beat or bruise an handful of the leaves or tops of Broom in half a pint of white-Wine, and so give it to the Patient to drink, to cause him to vomit, loose his belly and make him to sweat. Truly those that are wounded or bit with venemous Beasts, if they bind Broom above the wound, it will prohibit or hinder the venom from dispersing it self, or going any further: therefore a drink made thereof will prohibit the venom from going any nearer the heart. Some take of the root of Elecampane, Gentian, Tormentil, Kermes-berries, and Broom, of the Powder of Ivory and Harts-horn, of each half a dram; they do bruise and beat all these, and infuse them for the space of four and and twenty 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 provokes Sweat and infringeth the power of the poisons: and the Potion following hath the same virtue. Take good Mustard half an ounce, of Trea-

A Potion.

cle

cle or Mithridate the weight of a Bean; dissolve them in white Wine and a little *Aqua Vitæ*, and let the Patient drink it, and sweat thereon with walking. You may also roast a great Onion made hollow, and filled with half a dram of Treacle and Vinegar 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 any other cordial thing, and with strong Wine, and give the Patient to drink thereof to provoke sweat, and to repel the malignity. Or else take as much Garlick as the quantity of a Nut; of Rue and Celandine of each twenty leaves; bruise them all in white Wine and a little *Aqua Vitæ*; then strain it and give the Patient thereof to drink. There be some that do drink the juice that is pressed out of Celandine and Mallows, with three ounces of Vinegar, and half an ounce of the Oil of Wall-nuts, and then by much walking do unburthen their stomach and belly upwards and downwards, and so are helped. When the venemous air hath already crept into and infected the humours, one dram of the dried leaves of the Bay tree macerated for the space of two days in Vinegar and drunk, is thought to be a most soveraign Medicin to provoke sweat, loosenes of the belly and vomiting.

Matthiolus in his Treatise *De Morbo Gallico* writeth, that the Powder of *Mercury* ministred unto the Patient with the juice of *Carduus Benedictus*, or with the Electuary *De Gemmis*, will drive away the Pestilence before it be confirmed in the Body, by provoking vomit, loosnes of the belly and seat: one dram of *Calcanthum* or white Copperas dissolved in Rose water, performeth the like effect in the same disease. Some do give the Patient a little quantity of the Oil of Scorpions with white Wine, to expel the poison by vomit, and therewithall they anoint the region of the heart, the brest and the wrists of the hands. I think these very meet to be used often in bodies that are strong and well exercised, because weaker Medicins do evacuate little or nothing at all, but onely move the humours, whereby cometh a Fever. When a sufficient quantity of the malignity is evacuated, then you must minister things that may strengthen the belly and stomach, and with-hold the agitation or working of the humours: and such is the confection of Alkermes.

CHAP. XXVI.

Of many Symptoms which happen together with the Plague: and first of the pain of the Head.

IF the malignity be carried into the brain, and Nature be not able to expel it, it inflames 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 sometimes the memory, according to the situation of the inflammation, whether it be in the former, or hinder, or middle part of the head; but hereof cometh always a Phrensie, with fiery redness of the eyes and face, and heavines and burning of the whole head. If this will not be amended with Clysters, and with opening the Cephalick Vein in the arm, the arteries of the Temples must be opened, taking so much bloud 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 an artery will close and join together as readily, and with as little difficulty as the incision of the vein. And of such an incision of an artery cometh present help, by reason that the tensive and sharp vapours do plentifully breath out, together with the arterious bloud. It were also very good to provoke a flux of bloud at the nose, if Nature be apt to exonerate her self 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 cures the disease. Such bleeding is to be provoked by strong blowing, or striving to cleanse the nose by scratching or pricking of the inner side of the nostrils, by pricking with an horse-hair, and long holding down of the head.

The cause of Phrensie in the Plague.

The benefit of opening an artery.

Aph. 10. *sect.* 6.

The Lord of *Fountains*, a Knight of the Order, when we were at *Bayon*, had a bleeding at the nose, which came naturally for the space of two days, and thereby he was freed of a pestilent Fever which he had before, a great sweat arising therewithall; and shortly after his Carbuncles came to suppuration, and by Gods grace he recovered his health being under my cure. If the bloud do flow out and cannot be stopped when it ought, the hands, arms, and legs must be tied with bands, and Sponges wet in Oxycrate must be put under the arm-holes, Cupping-glasses must be applied unto the dugs, and to the region of the Liver and Spleen; and you must put into the nostrils the doun of the Willow tree, or any other astringent Medicin, incorporated with the hairs pluckt from the flank, belly or throat of an Hare, Bole-Armenick, *Terra Sigillata*, the juice of Plantain and Knot-grass mixed together; and furthermore the Patient must be placed or laid in a cool place. But if the Patient be nothing mitigated notwithstanding all these fluxes of bloud, we must come to Medicins that procure sleep, whose forms are these.

An History.

To stay bleeding.

Take of green Lettuce one handful, Flowers of Water-lillies and Violets, of each two pugils; one heap of white Poppy bruised, of the Four cold Seeds, of each two drams; of Licorice and Raisins of each one dram; make thereof a decoction, and in the straining dissolve one ounce and an half of *Diacodium*: make thereof a large potion to be given when they go to rest. Also Barly-cream may be 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 Poppy Seeds, of each half an ounce; and let the same be boiled in Broth with Lettuce and Purslain; also the Pills *De Cynoglosso*, *i. e.* Hounds-tongue may be given. Clysters that provoke sleep must be used, which may be thus prepared. Take of Barly-water half a pint, 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 Camphire seven grains, and the Whites of three Eggs: make thereof a Clyster. The head must be fomented with Rose Vinegar, the hair being first shaved away, leaving a double cloth wet therein on the same, and often renewed. Sheeps-lungs taken warm out of the bodies, may be applied to the head, as long as they are warm. Cupping-glasses with and without scarification may be applied to the neck and shoulder-blades. The arms and legs must be strongly bound, being first well rubbed, to divert the sharp vapours and humours from

Medicins to procure sleep.

from the head. Frontals may alſo be made on this manner. Take of the Oil of Roſes and Water-lillies, of each two ounces; of the Oil of Poppy half an ounce; of *Opium* one dram, of Roſe Vinegar one ounce, of Camphire half a dram; mix them together. Alſo Nodulaes may be made of the flowers of Poppies, Henbane, Water-lillies, Mandrags, beaten in Roſe water with a little Vinegar, and a little Camphire, and let them be often applied to the noſtrils: for this purpoſe Cataplaſms alſo may be laid to the forehead. As, Take of the mucilage of the ſeeds of *Pſilium, i. e.* Flea-wort, and Quince ſeeds extracted in Roſe water, three ounces; of Barly-meal four ounces, of the Powder of Roſe leaves, 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 vinegar of Roſes, of each three ounces; make thereof a Cataplaſm, and apply it warm to the head. Or take of the juice of Lettuce, of Water-lillies, Henbane, Purſlain, of each half a pint; of Roſe leaves in powder, the ſeeds of Poppy, of each half an ounce; Oil of Roſes three ounces, of Vinegar two ounces, of Barly-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 Medicins, and the inflammation of the brain aſſwaged, we muſt come unto digeſting, and reſolving fomentations, which may diſperſe the matter of the vapours. But commonly in pain of the head, they do uſe to bind the forehead and hinder part of the head very ſtrongly, which in this caſe muſt be avoided.

A Cataplaſm.

CHAP. XXVII.

Of the heat of the Kidnies.

THe heat of the Kidnies is tempered by anointing with *unguent. refrigerans Galeni* newly made adding thereto the Whites of Eggs well beaten, that ſo the Ointment may keep moiſt the longer; let this liniment be renewed every quarter of an hour, wiping away the reliques of the old. Or, ℞ *Aq. roſar.* ℔ ß. *ſucci plant.* ℥ iv. *alb. ovorum* iv. *olei roſacei, & nenuph. an.* ℥ j. *aceti roſ.* ℥ iij. *miſce ad uſum.* When you have anointed the part, lay thereon the leaves of Water-lillies, or the like old 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 Feather-bed, but on a quilt ſtuffed with the chaff of Oats, or upon a Mat with many doubled cloths or Chamlet ſpread thereon. To the region of the heart may in the mean time be applied a refrigerating and alexiterial Medicin, as this which followeth. ℞ *Ung. roſat.* ℥ iij. *olei nenuphærini,* ℥ j. *acet. roſ. & aq. roſ. an.* ℥ j. *theriacæ* ℥ j. *croci* ʒ ſ. Of theſe melted and mixed together, make a ſoft Ointment, which ſpread upon a ſcarlet cloth may be applied to the region of the heart. Or, ℞ *Theriacæ opt.* ʒ j. ſ. *ſucci citri, acidi, & limonis, an.* ℥ ſ. *coral. rub. & ſem. roſar. rub. an.* ʒ ß. *camphoræ & croci, an. gr.* iij. let them be all mixed together, and make an Ointment or Liniment.

An Ointment for the reins.

An oinement for the heart.

At the head of the Patient as he lies in his bed, ſhall be ſet an Ewer or Cock with a Baſin under it to receive the Water, which by the dropping may reſemble rain. Let the ſoles of the feet and palms of the hands be gently ſcratched, and the Patient lie far from noiſe, and ſo at length he may fall to ſome reſt.

The noiſe of dropping water draws on ſleep.

CHAP. XXVIII.

Of the Eruptions 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 bitings of Fleas or Gnats, which are not always ſimple, but many 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 colours, according to the virulency of the malignity, and condition of the matter, as red, yellow, brown, violet or purple, blue and black. And becauſe for the moſt part they are of a purple colour, therefore we call them Purples. Others call them *Lenticulæ*, becauſe they have the colour and form of Lentils. They are alſo called *Papiliones, (i.)* Butterflies; becauſe they do ſuddenly ſeize or fall upon divers regions of the body, like unto winged Butterflies, ſometimes the face, ſometimes the arms and legs, and ſometimes all the whole body; oftentimes they do not onely affect the upper part of the skin, but go deeper into the fleſh, ſpecially when they proceed of matter which is groſs and aduſt. They do ſometimes appear great and broad, affecting the whole arm, leg or face, like unto an *Eryſipelas:* to conclude, they are diverſe, according to the variety of the humour that offends in quantity or quality.

The differences of the ſpots in the Plague.

Their ſeveral names, and reaſons of them.

If they are of a purple or black colour, with often ſwouning, and ſink in ſuddenly without any manifeſt cauſe, they fore-ſhew death.

When ſigns of death.

The cauſe of the breaking out of thoſe Spots, is the working or heat of the blood, by reaſon of the cruelty of the venom received or admitted. They often ariſe at the beginning of a peſtilent Fever: many times before the breaking out of the Sore, or Botch, or Carbuncle, and many times after: but then they ſhew ſo great a corruption of the humours in the body, that neither the ſores nor carbuncles will ſuffice to receive them; and therefore they appear as fore-runners of death. Sometimes they break out alone, without a botch or carbuncle, which if they be red, and have no evil ſymptoms joined with them, they are not wont to prove deadly: they appear for the moſt part on the third or fourth day of the diſeaſe, and ſometimes later, and ſometimes they appear not before the Patient be dead; becauſe the working or heat of the humours being the off-ſpring of putrefaction, is not as yet reſtrained and ceaſed.

Why they ſometimes appear after the death of the Patient.

Wherefore then principally the putrid heat, which is greateſt a little before the death of the Patient, drives the excremental humours, which are the matter of the ſpots, unto the skin; or elſe becauſe Nature in the laſt conflict hath contended with ſome greater endeavour than before (which

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is common to all things that are ready to die) a little before the instant time of death, the Pestilent humour being 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.

YOu must first of all take heed lest you drive in the humour that is coming outwards with repercussives: therefore beware of cold, all purging things, phlebotomy, and drowsie or sound sleeping. For all such things do draw the humours inwardly, and work contrary to nature. But it is better to provoke the motion of Nature outwardly, by applying of drawing Medicins outwardly, and ministring Medicins to provoke sweat inwardly; for otherwise by repelling and stopping the matter of the eruptions, there will be great danger, lest the heart be oppressed with the abundance of the venom flowing back; or else by turning into the belly it infers a mortal bloudy flux: which discommodities that they may be avoided, I have thought good to set down this remedy, whose efficacy I have known and proved many times, and on divers persons, when by reason of the weakness of the expulsive faculty, 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. They are to be cured by driving forth.

I was brought unto the invention of this remedy, by comparison of the like: For when I understood, that the essence of the French Pox (and likewise of the Pestilence) consisted in a certain hidden virulency and venemous quality, I soon descended unto that opinion, that even as by the annointing of the body with the unguent compounded of Quick-silver, the gross and clammy humours which are fixed in the bones, and unmovable, are dissolved, relaxed and drawn from the center into the superficial parts of the body, by strengthening and stirring up the expulsive faculty, and evacuated by sweating and fluxing at the mouth; that so it should come to pass in pestilent Fevers, that Nature being strengthened with the same kind of unction, might unload her self of some portion of the venemous and pestilent humour, by opening the pores and passages and letting it break forth into spots and pustles, and into all kind of eruptions. Therefore I have anointed many in whom Nature seemed to make passage for the venemous matter very slowly, first loosing their belly with a Clyster, and then giving them Treacle-water to drink, which might defend the vital faculty of the heart, but yet not distend the stomach, as though they had the French Pox, and I obtained my expected purpose: In stead of the Treacle-water you may use the decoction of *Guaiacum*, which doth heat, dry, provoke sweat, and repel putrefaction, adding thereto also Vinegar, that by the subtilty thereof, it may pierce the better, and withstand the putrefaction. This is the description of the Unguent. The indication of curing taken from the like.

Take of Hogs-grease one pound, boil it a little with the leaves of Sage, Thyme, Rosemary, of each half an handful, strain it, and in the straining extinguish five ounces of Quick-silver, which hath been first boiled in Vinegar with the fore-mentioned herbs; of *Sal Nitrum* three drams, the Yolks of three Eggs boiled until they be hard, of Treacle and Mithridate, of each half an ounce, of Venice Turpentine, oil of Scorpions and Bays, of each three ounces, incorporate them all together in a mortar, and make thereof an Unguent, wherewith anoint the Patients arm-holes and groins, avoiding the parts that belong to the head, brest, and back-bone: then let him be laid in his bed, and covered warm, and let him sweat there for the space of two hours, and then let his body be wiped and cleansed; and if it may be, let him be laid in another bed, and there let him be refreshed with the decoction of a Capon, Reer-eggs, and with such like meats of good juice that are easie to be concocted and digested; let him be anointed the second and third day, unless the spots appear before. An ointment to draw them forth when they appear too slowly.

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 be convenient to use Diuretick Medicins, for by these the remnant of the matter of the spots, which happily could not all breath forth, may easily be purged and avoided by urin.

If any Noble or Gentlemen refuse to be anointed with this unguent, let them be inclosed in the body of a Mule or Horse that is newly killed, and when that is cold let him be laid in another, until the pustles and eruptions do break forth, being drawn by that natural heat, For so *Matthiolus* writeth, that *Valentinus* the sone of Pope *Alexander* VI. was delivered from the danger of most deadly poison which he had drunk. *In Procm. lib. 6. Dioſc.*

CHAP. XXX.

Of a pestilent Bubo, *or Plague-sore.*

A Pestilent *Bubo* is a tumor at the beginning long and movable, and in the state and full perfection copped, and with a sharp head, unmovable, and fixed deeply in the glandules or kernels, by which the brain exonerates it self of the venemous and pestiferous matter into the kernels that are behind 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 clammy, so that it cannot be 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 if it were, a cord or rope stretched out in the place, or a hardned nerve with pricking pain: and shortly after the matter is raised up, as it were into a knob, and by little and little it groweth bigger, and is inflamed, these accidents before mentioned accompanying it. If the tumor be red, and increased by little What a pestilent *Bubo* is.

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The ſigns of Buboes ſalutary and deadly.

and little, it is a good and ſalutary ſign: but if it be livid or black, and come very ſlowly unto his juſt bigneſs, it is a deadly ſign. It is alſo a deadly ſign if it increaſe ſuddenly, and come to its juſt bigneſs as it were with a ſwift violence, and as in a moment, have all the ſymptoms in the higheſt exceſs, as pain, ſwelling, and burning. *Buboes* or Sores appear ſometimes of a natural colour, 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 black; wherefore it is not good to truſt too much to thoſe kinds of tumors.

CHAP. XXXI.

Of the Cure of Buboes, *or Plague-ſores.*

The uſe of Cupping-glaſſes in curing of a Bubo.

SO ſoon as the Bubo appears, apply a Cupping-glaſs with a great flame unto it, unleſs it be that kind of Bubo which will ſuddenly have all the accidents of burning and ſwelling in the higheſt nature; but firſt the skin muſt be anointed with the Oil of Lillies, that ſo it being made more looſe, 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 be renewed and applied again every three quarters of an hour: for ſo at length the venom ſhould be the better drawn forth from any noble part that is weak, and the work of ſuppuration or reſolution, which ſoever Nature hath affailed will the better and ſooner be abſolved and perfected: which may be alſo done by the application of the following Ointment.

A Liniment.

Take of *Unguentum Dialthea* one ounce and a half, Oil of Scorpions half an ounce, of Mithridate diſſolved in *Aqua Vitæ*, half a dram; this liniment will very well relax and looſen the skin, open the pores thereof, and ſpend forth portion of the matter which the Cupping-glaſs hath drawn thither: inſtead thereof mollifying fomentations may be made, and other drawing and ſuppurating Medicins, which ſhall be deſcribed hereafter.

A Veſicatory applied in a meet place below the Bubo profits them very much, but not above; as for example: If the Bubo be in the throat, the Veſicatory muſt be applied unto the ſhoulder-blade on the ſame ſide; if it be in the arm-holes, it muſt be applied in the midſt of the arm, or of the ſhoulder-bone on the inner ſide: if in the groin, in the midſt 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 be the better exonerated.

Spurge, Crow-foot, Arſmart, Bear-foot, Briony, the middle bark of Travellers joy, the rinds of Mullet, *Flammula*, or upright Virgins power, are fit for raiſing bliſters. If you cannot come by thoſe ſimple Medicins, you may apply this which followeth, which may be prepared at all times.

A compound Veſicatory.

Take *Cantharides*, Pepper, *Euphorbium*, Pellitory of *Spain*, of each half a dram; of ſower leaven two drams, of Muſtard one dram, and a little Vinegar; the Vinegar is added thereto, to with-hold or reſtrain the vehemency of the *Cantharides*: but in want of this Medicin it ſhall ſuffice to drop ſcalding Oil or Water, or a burning Candle, or to lay a burning Coal on the place: for ſo you may raiſe bliſters, which muſt preſently be cut away, and you muſt ſee that you keep the ulcers open and flowing as long as you can, by applying the leaves of red Colworts, Beets, or Ivy dipped in warm Water, and anointed with oil or freſh butter. Some apply 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, becauſe that doth work rather by its quality than by its quantity. Let the abſceſs be fomented as is ſhewed before, and then let the Medicin following, which hath virtue to draw, be applied.

Why Veſicatories are better than Cauteries in a peſtilent Bubo.

Strong drawing Cataplaſms

Fill a great Onion being hollowed, with Treacle and the leaves of Rue, then roaſt it under the hot embers, beat it with a little Leaven, and a little Swines greaſe, and ſo apply it warm unto the abſceſs or ſore; let it be changed every 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-greaſe as ſhall ſuffice: make thereof a Cataplaſm according to Art. Or, Take of Onions and Garlick roaſted in the embers, of each three ounces: bruiſe them with one ounce of ſowre leaven: adding thereto *Unguentum Baſilicon* one ounce, Treacle one dram, Mithridate half a dram, of old Hogs-greaſe one 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 very profitable; for it is hot, and therefore attractive, being mixed with old Leaven and *Baſilicon*: you ought to uſe this until the abſceſs be grown unto its full ripeneſs and bigneſs; but if preſently after the beginning there be great inflammation, with ſharp pain, as it often happeneth, eſpecially when the abſceſſes be of the kind of Carbuncles; we muſt abſtain from thoſe remedies that are hot and attractive, and alſo from thoſe that are very emplaſtick and clammy, becauſe they do altogether cloſe the pores of the skin; or becauſe they reſolve the thinner part of the collected matter, which if it might remain, would bring the other ſooner to ſuppuration: or elſe becauſe they may perchance draw more quantity of the hot matter than the part can bear, whereof cometh rather corruption than maturation: and laſt of all, becauſe they increaſe the Fever and Pain, which infer the danger of a Convulſion or mortal Gangrene. Therefore in ſuch a caſe it is beſt to uſe cold and temperate local Medicins, as the leaves of Henbane and Sorrel roaſted under the coals, *Galens* Pultiſe, and ſuch like.

Againſt ſuch as cut away Plague-ſores.

There are many 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 become 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 come from without, as the bitings of virulent Beaſts, but from within, and more-

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over becauſe pain is by theſe means increaſed, and the humour is made more malign and fierce. Therefore I think it ſufficient to uſe Medicins 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 a handful, of Lin-ſeeds half an ounce, of the leaves of Rue half an handful: boil them and ſtrain them, dip ſponges in the ſtraining, and therewith let the tumour be fomented a long time. A digeſtive fomentation.

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 yolks of three Eggs; put them all on ſtupes or flax, and apply them warm unto the place. An anodyne Cataplaſm.

Or, Take of fowre Rie-leaven four ounces, of Baſilicon two ounces, three yolks of Eggs, Oil of Lillies two ounces, Treacle one dram: let it be received on ſtupes, and applied in like manner.

Or, Take of *Diachylon* and *Baſilicon* of each two ounces, Oil of Lillies one ounce and a half: let them be melted and mixed together, and let it be applied as is above ſaid.

When you ſee, feel and know, according to reaſon, that the Bubo is come to perfect ſuppuration, it muſt be opened with an inciſion-knife, or an actual or potential Cautery, but it is beſt to be done with a potential Cautery, unleſs that happily there be great inflammation, becauſe 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 left while Nature doth work ſlowly, a venemous vapour ſhould be ſtirred up, with ſtriking the heart by the arteries, the brain by the nerves, and the liver by the veins, ſhould cauſe a new increaſe of the venemous infection. For fear whereof there be ſome that will not expect the perfect maturation and ſuppuration, but as it were in the midſt of the crudity and maturity, will make an orifice for it to paſs forth at: yet if it be done before the tumor be at his perfect maturity, Pain, a Fever, and all accidents are ſtirred up, and enraged, whereof cometh a malign ulcer that often degenerates into a Gangrene. For the moſt part about the tenth or eleventh day the work of ſuppuration ſeemeth perfected and finiſhed; but it may be ſooner or later, by reaſon of the application of Medicins, the condition of the matter, and ſtate of the part: when the matter cometh forth, you muſt yet uſe ſuppurative and mollifying Medicins, to maturate the remains thereof; in the mean while cleanſing the ulcer by putting mundificatives into it, as we ſhall declare in the cure of Carbuncles. But if the tumor ſeem to ſink in, or hide it ſelf again, it muſt be revoked and procured to come forth again, by applying of Cupping-glaſſes with ſcarification, and with ſharp Medicins, yea, and with Cauteries both actual and potential. Why it is beſt to open a Plague-ſore with a potential Cautery. How to draw forth a ſore that ſeems to go in again.

When the Cauteries are applied it ſhall be very good to apply a Veſicatory a little below it, that there might be ſome paſſage open for the venom while the Eſchar is in falling away. For ſo they that are troubled with the French Pox, 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 being 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 colour, as are thoſe that come of a melancholick humour by aduſtion, turned into a groſs and rebellious melancholick humour, ſo that by the more copious influx thereof into the part, there is a danger of a gangrene and mortification; then the places about the abſceſs muſt be armed with repercuſſives, but not the abſceſs it ſelf: and this may be the form of the repercuſſives: Take of the juice of Houſleek, Purſlain, Sorrel, Night-ſhade, of each two ounces; of Vinegar one ounce, the Whites of three Eggs, of Oil of Roſes and Water-lillies of each two ounces and an half, ſtir them together, and apply it about the Bubo, and renew it often: or boil a Pomgranate in Vinegar, beat it with *Unguentum Roſatum*, or *Populeon* newly made, and apply it as is aforeſaid. If theſe things do not ſtop the influx of other humours, the abſceſs it ſelf and the places about it muſt be 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 quantity and malignity of the humours that flow unto it. In ſcarifying you muſt have care of great veſſels, for fear of an irrepugnable flux of bloud, which in this caſe is very hard to be ſtaid or reſiſted, both becauſe the part it ſelf is greatly inflamed, and the humour very fierce; for the expulſion whereof, Nature careful for the preſervation of the part and all the body beſides, ſeemeth to labour and work. But yet you muſt ſuffer ſo much of the bloud and humour 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 malignity, with relaxing, mollifying, and reſolving fomentations: as, Take the roots of Marſh-mallows, Lillies and Elecampane, of each one pound; of Line-ſeeds and Fenugreek, of each one ounce, of Fennel-ſeeds, and Annite-ſeeds, of each half an ounce, of the leaves of Rue, Sage, Roſemary, of each one handful, of Camomil and Melilot flowers, 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, we may put Hens, or Turkies that lay Eggs (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 than Cupping-glaſſes, becauſe they are endued with a natural property againſt poiſon, for they eat and concoct Toads, Eſts, and ſuch like virulent Beaſts: when one Hen is killed with the poiſon that ſhe hath drawn into her body, you muſt apply another, and then the third, fourth, fifth, and ſixth, within the ſpace of half an hour. There be ſome that will rather cut them, or elſe uſe whelps cut aſunder in the midſt, and applied warm to the place; that by the heat of the Creature that is yet ſcarce dead, portion of the venom may be diſſipated and exhaled. But if nevertheleſs there be any fear of a Gangrene at hand, you muſt cut the fleſh with a deeper ſcarification, not onely avoiding the great veſſels, but alſo the nerves, for fear of convulſion; and after the ſcarification and a ſufficient flux of bloud, you muſt waſh it with Ægyptiacum, Treacle and Mithridate diſſolved in Sea water, *Aqua Vitæ* and Vinegar. For ſuch a lotion hath virtue to ſtay putrefaction, repel the ve-

When repercuſſives may be applied.

Why too much bleeding is to be feared.

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nom, and prohibit the bloud from concretion: but if the Gangrene cannot be avoided ſo, Cauteries may be applied to the part: eſpecially actual, becauſe 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 be cut away even unto the quick fleſh, that the venomous vapours and the humours may have a free paſſage forth; for it is not to be looked for, that they will come forth of themſelves. With theſe inunctions they are wont to haſten the falling away of the Eſchar. Take of the mucilage of Marſh-mallows and Line-ſeeds, of each two ounces, freſh Butter or Hogs-greaſe one ounce, the yolks of three Eggs; incorporate them together, and make thereof an Ointment: Butter, Swines-greaſe, Oil of Roſes with the yolks of Eggs, perform the ſelf ſame thing. When the Eſchar is fallen away, we muſt uſe digeſtives. As, Take of the juice of Plantain, Water-Betony, and Smallage, of each three ounces, honey of Roſes four ounces, Venice Turpentine five ounces, Barly flower three drams, Aloes 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 Aloes, Maſtich, Myrrh, Barly-flower, of each one dram, of Mithridate half an ounce; incorporate them together. The unguent that followeth is very meet for putrefied and corroding 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 dry up virulent humidities that engender Gangrenes. But there is not a more excellent unguent than *Ægyptiacum* increaſed in ſtrength, for beſides many 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 Medicins convenient for ſuch Ulcers, is delaid, and as it were dulled and hindered from their perfect operation, ſo long as the ulcer is kept open. There have been many that being diſeaſed with this diſeaſe, have had much matter and venomous filth come out at their abſceſs; ſo that it ſeemed ſufficient, and they have been thought well recovered, yet have they died ſuddenly. In the mean while when theſe things are in doing, cordial Medicins are not to be omitted to ſtrengthen the heart: And Purgations muſt be renewed at certain ſeaſons, that Nature may be every way unloaded of the burthen of the venenate humours.

Liniments haſten the falling away of the Eſchar.

Againſt eating Ulcers.

The praiſe of *Ægyptiacum*.

CHAP. XXXII.

Of the Nature, Cauſes, and Signs of a Peſtilent Carbuncle.

What a Carbuncle is.

A Peſtilent Carbuncle is a ſmall tumor, or rather a malign puſtle, hot, and raging, conſiſting of bloud vitiated by the corruption of the proper ſubſtance. It often cometh to paſs through the occaſion of this untamable malignity, that the Carbuncle cannot be governed or contained within the dominion of Nature. In the beginning it is ſcarce ſo big as a ſeed or grain of Millet or Peaſe, ſticking firmly unto the part and immovable, ſo that the skin cannot be pulled from the fleſh; but ſhortly after it increaſeth like to a Bubo, unto a round and ſharp head, with great pricking pain, as if it were with needles, burning and intolerable, eſpecially a little before night, and while the meat is in concocting, more than 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 find the fleſh under it parched, burned and black, as if there had been a burning coal laid there, whereby it ſeemeth that it took the name of Carbuncle; but the fleſh that is about the place is like a Rainbow, of divers colours, as red, dark green, purple, livid and black; but yet always with a ſhining blackneſs, like unto Stone-Pitch, or like unto the true precious ſtone which they call a Carbuncle, whence ſome alſo ſay it took the name. Some call it a Nail, becauſe it inferreth like pain as a Nail driven into the fleſh. There are many Carbuncles which take their beginning with a crufty ulcer without a puſtle, like to the burning of an hot Iron: and theſe are of a black colour, they increaſe 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 be ſo heavy, as if it were covered or preſſed with lead tied hard with a ligature: There cometh mortal ſwounings, faintings, totling, turning, idle talking, raging, gangrenes and mortifications; not onely to the part, but alſo to the whole body; by reaſon (as I think) of the oppreſſion of the ſpirits of the part, and the ſuffocation of the natural heat, as we ſee alſo in many that have a peſtilent Bubo: for a Bubo and Carbuncle are tumors of a near affinity, ſo that the one doth ſcarce come without the other, conſiſting of one kind of matter, unleſs that which maketh the Bubo is more groſs and clammy, and that which cauſeth the Carbuncle more ſharp, burning and raging, by reaſon of its greater ſubtilty, ſo that it maketh an Eſchar on the place where it is, as we noted before.

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 be made in Peſtilent Buboes and Carbuncles.

SOme having the Peſtilence have but one Carbuncle, and ſome more, in divers parts of their body, and in many it happeneth that they have the Bubo and Carbuncle before they have any Fever; which giveth better hope of health, if there be 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 come to aſſault the heart. But if a Carbuncle and Bubo come after the Fever, it is mortal; for it is a token that the heart is affected, moved and incenſed with the furious rage of the venom, whereof preſently cometh a feverith heat or burning, and corruption of the humours, ſent as it were from the center unto the ſuperficies of the body. It is a good ſign, when the

Why it is deadly to have a ſore come after the Fever.

the Patients mind is not troubled, from the beginning until the seventh day; but when the Bubo or Carbuncle sinketh down again shortly after that it is risen, it is a mortal sign, especially if ill accidents follow it. If after they are brought to suppuration they presently wax dry without any reason thereof, it is an ill sign: Those Carbuncles that are generated of bloud have a greater Eschar than those that are made of choler, because that bloud is of a gross consistence, and therefore occupieth a greater room in the flesh: contrariwise, a cholerick humour is more small in quantity and thin, and it taketh little room in the upper 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 artery or wind-pipe might be seen bare, when the Eschar was fallen away. I had once a Carbuncle which was in the midst of my belly, so that when the Eschar was fallen away, I might very plainly see the *Peritonæum* or Rim; and the cicatrice that remaineth is as broad as my hand; but they do not spread themselves so far, without the great danger or death of the Patient. There also some Carbuncles which beginning at the parts under the chin, disperse themselves by little and little unto the battle-bones, and so strangle the Patient. So in many 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 quantity, and so terrible to be seen, there is great danger of death to the Patient, or at least to the grieved 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 many. Often-times also the corruption of the matter is so great, that the flesh leaveth the bones bare: but Carbuncles often leave the joints and ligaments quite resolved, through the occasion of the moisture that is soaked and sunk into them; for they often cast out putrefied and virulent sanious matter, whereby eating and creeping ulcers are bred, many blisters and pustles arising up in the parts round about it; which shortly breaking into one, make a great ulcer. These come very seldom and slowly unto suppuration, or at least to cast out laudable matter, especially if they have their original of choler; because the matter is sooner burned with heat than suppurated. Therefore then, if they can be brought to suppuration by no Medicins, if the tumor still remain black, if when they are opened, nothing at all, or else a very little sharp moisture doth come forth, they are altogether mortal, and there is scarce one of a thousand who hath these accidents that recovereth health. Dispersed small blisters, coming of vapours stirred up by the matter that is under the skin, and are there staid and kept from passage forth, do not necessarily fore-shew death in Carbuncles. But if the part be swollen or puffed up, if it be of a green or black colour, and if it feel neither pricking nor burning, it is a sign of a mortal gangrene. Buboes or Carbuncles seldom or never come without a Fever: but the Fever is more vehement when they are in the emunctories or nervous parts, than when they are in the fleshy 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 be vexed in such sort with a Carbuncle that nothing thereof appeareth forth on the superficial parts, all hope of life is past, and those suddenly die, eating, drinking, or walking, and not thinking any thing of death. If the Carbuncle be in the Midriff or Lungs, they are soon suffocated: if it be in the Brain, the Patient becometh frantick, and so dieth: if it be in the parts appointed for the passage of the urine, they die of the suppression of their water, as it happened in the Queen-mothers waiting maid, at the Castle of *Rossillon*, of whom I spake before: if it be in the Stomach, it inferreth the accidents that are shewed in this History following.

Huge pestilent abscesses commonly deadly.

Deadly Carbuncles.

While I was a Surgeon in the Hospital of *Paris*, a young and strong Monk of the order of S. *Victor*, being overseer of the Woman that kept the sick people of that place, fell into a continual Fever very suddenly, with his Tongue black, dry, rough, (by reason of the putrefied and corrupted humours, and the vapours rising from the whole body to that place) and hanging out like unto a Hounds, with unquenchable thirst, often swouning and desire to vomit: he had convulsions over all his body, through the vehemency and malignity of the disease, and so he died the third day. Wherefore those that kept the sick people in the Hospital, thought that he had been poisoned, for the certain knowledge whereof the Governours of the Hospital commanded his body to be opened. I therefore calling to me a Physician and Surgeon, we found in the bottom of his stomach, a print or impression, as if it had been with an hot iron or potential Cautery, with an Eschar or crust as broad as ones nail, all the rest of his stomach was greatly contracted and shrunk up together, and as it were horny; which we considering, and especially the Eschar which was deep in the substance of the stomach, we all said with one voice, that he was poisoned with Sublimate or Arsenick. But behold, while I was sewing up his belly, I perceived many black spots dispersed diversly throughout the skin: then I asked my company what they thought of those spots? truly (said I) it seemeth unto me 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 bitings of Fleas. But I perswaded them to consider the number of them over all the whole body, and also of their great depth and depression into the flesh; for when we had thrust Needles deep into the flesh in the midst of them, and so cut away the flesh about the needle, we found the flesh about the needle to be black: moreover his nostrils, nails, and ears, were livid, and all the constitution of his body was contrary, 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 he died, that his familiar friends could hardly know him. We perswaded by these proofs, revoked our former opinion and sentence, and made a Certificate to be sent unto the Governours and Masters of the Hospital, setting our hands and seals unto it, to certifie them that he died of a pestilent Carbuncle.

An History.

How to distinguish Purple spots from Flea-bitings.

CHAP. XXXIV.

Of the Cure of a Peſtilent Carbuncle.

Why emplaſtick, very hot, and great drawers are not good for a Carbuncle.

BY the fore-named ſigns of a peſtilent Carbuncle, and eſpecially by the bitterneſs of the pain, malignity of the venomous matter, and by the burning Fever that is therewithall annexed, I think it manifeſt, that very hot, emplaſtick, and drawing Medicins ſhould not be applied to this kind of tumor, becauſe they prohibit or hinder the exhalation, or waſting forth of the venenate malignity, becauſe that by ſtopping the pores of the skin, they increaſe and cauſe a greater heat in the part than there was before. Therefore it is better to uſe reſolving Medicins which may aſſwage heat, and reſolve the pores of the skin. Therefore firſt the place muſt be 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*, to make the skin thin, and to draw forth the matter; and the day following you muſt apply the Cataplaſm following.

A Cataplaſm for a peſtilent Carbuncle.

Another.

Take the leaves of Sorrel and Henbane, roaſt them under the hot aſhes, afterwards beat them with four yolks of Eggs, two drams of Treacle, Oil of Lillies, three ounces, Barly-meal as much as ſhall ſuffice: make thereof a Cataplaſm in the form of a liquid Pultiſe: 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 Serſe, adding thereto of freſh Butter one ounce and half, Mithridate one dram, of Barly-meal as much as ſhall ſuffice: make thereof a Cataplaſm according to Art. Thoſe Cataplaſms that follow, are moſt effectual to draw the venomous 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, Pigeons dung, Sope, of each one dram; ſix Snails in their ſhells, of fine Sugar, Treacle and Mithridate, of each half a dram; beat them altogether and incorporate them with the yolks of Eggs: make thereof a Cataplaſm, and apply it warm. Or, Take the yolks of ſix Eggs, of Salt powdered one ounce, of Oil of Lillies and Treacle, of each half a dram; Barly-meal as much as will ſuffice: make thereof a Cataplaſm. Take of ordinary Diachylon four ounces, of *Unguentum Baſilicon* two ounces Oil of Violets half an ounce: make thereof a Medicin. Many ancient Profeſſors greatly commend Scabious ground, or brayed between two ſtones, and mixed with old Hogs-greaſe, the yolks of Eggs, and a little Salt, for it will cauſe ſuppuration in Carbuncles, alſo an Egg mixed with Barly-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 Colts-foot doth extinguiſh the heat of Carbuncles: the Herb called Devils-bit being bruiſed, worketh the like effect. I have often uſed the Medicin following to the heat of Carbuncles with very good ſucceſs; it doth alſo aſſwage pain and cauſe ſuppuration. Take of the Soot ſcraped from a Chimney four ounces, of common Salt two ounces, beat them into ſmall Powder, adding thereto the yolks of two Eggs, and ſtir them well together, until it come to have the conſiſtence of a Pultiſe, and let it be applied warm unto the Carbuncle. In the beginning the point or head of the Carbuncle muſt be burned, if it be black, by dropping thereinto ſcalding hot Oil, or *Aqua fortis*; for by ſuch a burning the venom is ſuffocated, as touched by lightning, and the pain is much leſſened, as I have proved oftentimes: neither is it to be feared leſt that this burning ſhould be too painful, for it toucheth nothing but the point of the Carbuncle, which by reaſon of the Eſchar that is there, is void of ſenſe. After this burning, you muſt go forward with the former deſcribed Medicins, until the Eſchar ſeemeth to ſeparate it ſelf from the fleſh round about it, which is a token of the Patients recovery, 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 we have preſcribed in a Peſtilent Bubo; not omitting ſometimes the uſe of ſuppurative and mollifying Medicins: that while the groſs matter is cleanſed, that which is as yet crude may be brought to ſuppuration: for then the indication is two-fold, the one to ſuppurate that which remains as yet crude and raw in the part, and the other to cleanſe that which remains concocted and perfectly digeſted in the ulcer.

Other Cataplaſms.

The effect of Scabious againſt a peſtilent Carbuncle.

A Raddiſh root draws out the venom powerfully.

The top of a Carbuncle, when, why, and with what to be burned.

The falling of the Eſchar promiſeth health.

A twofold indication.

CHAP. XXXV.

Of the itching and inflammation happening in Peſtilent Ulcers, and how to cicatrize them.

Why the adjacent parts are troubled with itching.

THe parts adjoining 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 cauſe may happen either externally or internally; internally, by a thin and biting *ſanies*, which ſweating from the Ulcer, moiſtens the neighbouring parts. But externally by the conſtipation of the pores of the skin, induced by the continual application of Medicins. To remedy this the place muſt be fomented with diſcuſſing and relaxing things, as *Aqua fortis*, which the Goldſmiths have uſed for ſeparating of Metals, Alum-water, the water of Lime, Brine, and the like.

A fomentation for this itch.

Why theſe Ulcers are hard to be cicatrized.

But Ulcers left by Carbuncles and peſtilent Buboes, are difficultly cicatrized, by reaſon of the corroding *ſanies* proceeding from the cholerick or phlegmatick and ſalt blood, which being in fault by the corruption of the whole ſubſtance, cauſeth the abſceſs: beſides, ſuch Ulcers are commonly round, and therefore hard to be cicatrized, for that the Quitture hath no free paſſage forth; ſo the *ſanies*, of its own nature acrid and corroding, doth by delay acquire greater acrimony and nitrofity; ſo by its burning touch diſſolving the adjacent fleſh, it hinders the conjunction and

and unition of the lips of the ulcer: but in the interim, the lips of the ulcer become callous, which unless they be helped by cutting, or eating Medicins, the ulcer cannot be healed; for that by their density they hinder the sweating out of a sufficient quantity of the dewy glew, to heal up the ulcer. Now the ulcer being plained and brought equal to the other flesh, we must use Epuloticks; that is, such things as have a faculty to cicatrize Ulcers by condensing and hardning the surface of the flesh: Of these there are two kinds; for some without much biting bind and dry, such are Pomgranat-pills, Oak-bark, Tutia, Litharge, burnt Bones, Scales of Brass, Galls, Cypress-nuts, Minium, Antimony, Bole-Armenick, the burnt and washed shells of Oysters, Lime nine times washed, and many Metalline things. Others are next to these, by which proud flesh is consumed; but such must be sparingly used: Of this kind is washed Vitriol, burnt Alum, which excelleth other Epuloticks, by reason of the excellent drying and astringent faculty consolidating the flesh, which by being moistned by an excrementitious humour, grows lank. For that the scar which is made, is commonly unsightly in this kind of Ulcers, as red, livid, black, swollen, rough, by reason of the great adustion imprinted in the part, as by a burning coal: therefore I have thought good here to set down some means, by which this deformity may be corrected or amended. If the scar be too big, or high, it shall be plained by making convenient ligation and straight binding to the part a Plate of Lead rubbed over with Quick-silver; but you may whiten it by anointing it with Lime nine times washed, (that so it may be more gentle, and lose the acrimony) and incorporated with Oil of Roses. Some take two pound of Tartar or Argal, 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 receive the dropping of Liquor, which is good to be rubbed for a good space upon the scar. The same faculty is thought to be in that moisture of Eggs, which sweats through the shell, whilest they are roasted at the coals; as also *unguentum citrinum* and *Emplast. de cerussa* newly made. The three following compositions are much approved. ℞ *Axungiæ suillæ novies lotæ in aceto acerrimo* ℥ iv. *cinab. succi citri, & alum. ustiꝰ an.* ℥ ß. *sulphur. vivi ignem haud experti,* ʒ ij. *camph.* ℈ ij. *fiat pulvis*; then let them all be incorporated together, and make an Ointment: it attenuates the skin, and cleanseth spots. ℞ *Olei hyosc. olei semin. cucurb. an.* ʒ j. *olei tartar.* ℥ ß. *ceræ alb.* ʒ iij. *liquefiant simul lento igne; deinde adde sperm. ceti* ʒ vj. *removeantur prædicta ab igne donec infrigid. postea adde troch. alb. Rhasis pul.* ʒ iij. *camph.* ʒ j. *tandem cum mali citri succo omnia diligent. commisce, fiat linimentum.* Or else, ℞ *Rad. serpent.* ℥ j. *bulliat in aqua com.* ℔ j. *ad dimid. deinde adde sulph. vivi ignem non experti, & alum. crudi, pulveris. an.* ʒ j. ℈. *colent. prædict. & addatur caph.* ʒ j. *succi hyoscyami* ʒ j. ℈. Let this Medicin be kept in a lead or glass Vessel; and when you would use it, dip linnen cloths therein, and lay them to the part. You may also use these Medicins against the redness of the Face; and you may fetch them off in the morning by washing the Face with warm Water and Bran.

Two sorts of Epuloticks.

Remedies against the deformity of scars.

Ointments to attenuate and take away scars.

CHAP. XXXVI.

Of sundry kinds of Evacuations, and first of Sweating and Vomiting.

THe pestilent malignity 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 Belly, and other ways; so that Nature by every kind of excretion may be freed from the deadly poison, especially that which is not as yet arrived at the heart. But chief regard must be had to the inclination of Nature, and we must attend what way it chiefly aims at, and what kind of excretion it affects. Yet such evacuations are not always critical, but usually symptomatical; for that oft-times Nature is so irritated by the untamable malignity of the matter, that it can no way digest it, but is forced by any means to send it away crude as it is. Wherefore if Nature may seem by the moistness of the skin, the suppression of Urin, 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 Ancients, that all Sweats in acute diseases are salutary, which happen upon a critical day, which are universal and hot, and signified before the critical day. But in this rapid and deadly disease of the Plage, we must not expect a *Crisis*, but as soon as we can, and by what means we may, to free Nature from so dire and potent an Enemy.

Why the pestil. nt malignity is not carried away by one way, but by many.

We must have chief regard to the motion of Nature.

Signs of future Sweat.

A *crisis* must not be expected in the Plague.

But oft-times the tough and gross excrementitious humours may be purged by Vomit, which could not be evacuated by strong Purges. Therefore also by this manner of excretion may we hope for the exclusion of the pestilent venom, if there be nothing which may hinder; and Nature by frequent nauseousness may seem to affect this way: the endeavour thereof shall be helped by giving some half a pint of warm Water to be drunk with four ounces of common Oil, an ounce of Vinegar, and a little juice of Raddish: after the taking of the potion, it is fit to thrust into the throat a Goose-quill dipped in the same Oil, or else a branch of Rosemary: or else by thrusting in the fingers, so to procure vomit; also a portion of eight ounces of the mucilaginous water of the decoction of Line-seeds will procure Vomit. Or else, ℞ *Rad. raph. in taleol. sect. vel sem. ejus, & sem. atriplicis, an.* ʒ iij. *bulliant in aqua com. quod sufficit pro dos. in colatura dissolve oxym. & syr. acet. an.* ʒ ß. *exhibeatur potio larga & tepida.* Or else, ℞ *Oxym. Gal.* ℥ vj. *ol. com.* ℥ ij. *paretur potio tepid.* But Nature must not be forced, unless of its own accord it undertake this motion, for forced and violent vomiting, distends the nervous fibres of the ventricle, dejects the strength, breaks the vessels of the lungs, whence proceeds a deadly spitting of blood. Wherefore if the stomach shall trouble it self with a vain and hurtful desire to vomit, it shall rather be strengthened with bags of Roses, Wormwood, and Sanders, using inwardly the juice of Quinces and Berberries, and Broths made for the same purpose.

How to procure Vomit.

Why Vomit must not be forced.

CHAP. XXXVII.

Of Spitting, Salivation, Belching, Hicketing, and making of Water.

The effect of Spitting in Peſtilent diſeaſes

THat long evacuations may be made by Spitting and Salivation, you may learn by the example of ſuch as have a Pleuriſie; for the matter of the Pleuriſie being turned into *pus*, the purulent matter ſuckt 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 be procured by a Maſticatory of the roots of *Ireos*, Pellitory of *Spain*, Maſtich, and the like; the mucilage of Line-ſeed held in the mouth will work the ſame effect.

The force of Sneezing.

That ſuch as have a moiſt brain may expel their ſuperfluous humours by ſneezing and blowing their noſes; the brain, by the ſtrength of the expulſive faculty, being ſtirred up to the exclusion of that which is harmful, may be known by the example of old people and children which are daily purged by their noſes; the brain is ſtirred up to both kinds of excretion from cauſes either internal or external: from the internal, as by a phlegmatick and vaporous matter, which contained in the brain, offends 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-ſeeds, and the like Sternutamentories. For then the brain is ſtraitned by its own expulſive faculty, to the excretion of that which is troublous unto it. Sneezing breaketh forth with noiſe, for that the matter paſſeth through ſtraits, to wit, by the ſtraitning paſſages of the *Os cribroſum*, which is ſeated at the roots of the noſtrils. It is not fit to cauſe ſneezing in a body very plethorick, unleſs you have firſt premiſed general Medicins, leſt the humours ſhould be more powerfully drawn into the brain, and ſo cauſe an Apoplexy, *Vertigo*, or the like ſymptoms.

The commodities of Belching.

By Belching the flatulencies contained in the ventricle, being the off-ſpring of crudity, or flatulent meats, are expelled: theſe by their taſte and ſmell, pleaſing, ſtinking, ſweet, bitter or tart, ſhew the condition and kind of crudity of the humours from whence they are raiſed: now vomiting freeth the ſtomach of crudities, but the diſtemper muſt be corrected by contraries, as altering things to be 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 cauſe thereof, but ſometimes inanition alſo; ſo oft-times a putrid vapour from ſome other place, breaking into the ſtomach, as from a peſtilent Bubo or Carbuncle; alſo all acid and acrid things, becauſe they prick, vellicate and provoke the tunicles of the ventricle, as Vinegar, ſpiced things, and the like; often and contumacious hicketting after purging, a wound or vomiting, is ill; but if a convulſion preſently happen thereon, it is deadly.

Several remedies muſt be uſed according to the variety of the cauſes: for repletion helps that hicketting that proceeds from inanition, and evacuation that which happens by repletion: that which proceeds from a putrid and venemous vapour, is helped by Treacle and Antidotes; that which is occaſioned by acid and acrid things, is cured by the uſe of groſs, fatty, and cold things.

The whole body purged by urin.

Now the whole body is oft-times purged by urin, and by this way the feverish matter is chiefly and properly accuſtomed to be evacuated: not a few being troubled with the *Lues Venerea*, when as they could not be brought to ſalivation by unction, have been cured by the large evacuation of urin cauſed by Diuretick Medicins. Diureticks wherewithall you may move urin, are formerly deſcribed in treating of the Stone. But we muſt abſtain from more acrid Diureticks, eſpecially when as inflammation is in the bladder; for otherwiſe the noxious humours are ſent to the affected part, whence there is danger of a deadly Gangrene. Therefore then it is better to uſe diverſion by ſweat.

When we ought to abſtain from Diureticks.

CHAP. XXXVIII.

Of the Menſtrual *and* Hæmorrhoidal *Purgation.*

NOt onely Reaſon, but alſo manifold experience induceth us to believe that Women by the benefit of their menſtrual purgation, eſcape and are freed from great, peſtilent, and abſolutely deadly diſeaſes; wherefore it muſt be procured by remedies, both inwardly taken, and outwardly applied: theſe may be taken inwardly with good ſucceſs, *Caſſia Lignea*, Cinnamon, the Bark of the Root of a Mulberry, Saffron, Agarick, Nutmeg, Savine, *Diagridium*, and divers others. But if the affect require more vehement Medicins, the roots of Tithymal, Antimony, Cantharides (taken in ſmall quantity) move the Courſes moſt powerfully; frictions 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, Nodulaes, Clyſters, Baths, Fomentations made of odoriferous things, which by the fragrancy of their odour, or rather by their heat may attenuate and cut groſs humours, open the obſtructed orifices of the Veins; ſuch are the Roots of Marſh-mallows, Orris, Parſly, Fennel, Knecholm, the Leaves and Flowers of St. *Johns* Wort, Aſparagus, Rocket, Balm, Chervile, Mugwort, Mints, Penny-royal, Savory, Roſemary, Rue, Tyme, Sage, Bay-berries, Broom, Ginger, Cloves, Pepper, Nutmegs, and the like; the vapour of the boiling whereof, let the Woman, ſitting upon a perforated ſeat, receive by a funnel into the neck of her Womb, covering her ſelf warm on all ſides, that ſo nothing may otherwiſe break forth. Of the ſame things may be made baths, as well general, as particular. Alſo Peſſaries are good made after this manner: ℞ *Theriac. Mithridat.* ana 3ß. *cætor.*

How to provoke the Courſes.

How aromatick things provoke the Courſes.

caſtor. gum. ammoniac. an. ℥ j. *miſce cum bombace in ſucco mercurialis tincto, fiat peſſarium.* Or elſe, ℞ *Rad. petroſelin. & ſæniug. ſub cineribus coctas, deinde contuſas cum pul. ſtaphyſag. pyreth. croco & oleo Iilierum*; ſo make a peſſary in the form of a ſuppoſitory or nodula. ℞ *Pulv. myrrh. & aloes, an.* ℥ j. *ſol. ſabin. nigel. artheniſ. an.* ℥ ij. *rad. Helleb. nigr.* ℥ j. *croci,* ℈ j. *cum ſucco mercur. & melle communi:* make a peſſary in cotton. This which follows is more effectual. ℞ *Succi rut. abſinth. an.* ℥ ij. *myrrh. euphorb. caſtor. ſabin. diacrid. terebinth. galban. theriac. an.* ℥ j. make a peſſary 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 pleaſe. Peſſaries to provoke the Terms.

But if this menſtruous flux once provoked, flow too immoderately, it muſt be ſtopped by uſing meats of groſſer and more viſcid juice, by opening a vein in the arm, application of Cupping-glaſſes under the duggs, frictions and ligations of the upper parts, as the arms, putting up of peſſaries, application of refrigerating and aſtringent plaſters to the lower belly, 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 bloud flowing out of the womb. ℞ *Aquæ plant. & ſabror. an.* lb j. *nucum cupreſ. gallar. immatur. an.* ℥ ij. *berber. ſtomach. balauſt. vitriol. rom. alum. roch. an.* ℥ ij. *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 endeavour to free it ſelf of the peſtilent matter by the *hæmorhoids*, you may provoke them by frictions 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 roaſted under the embers, and incorporated with Treacle and a little Oil of Rue: after the hæmorrhoid veins, by theſe means, come to ſhew themſelves, they ſhall be rubbed with rough linnen cloths, or Fig-leaves, or a raw Onion, or an Ox-gall mixt with ſome powder of *Colloquintida*. Laſtly, you may apply Horſe-leeches, or you may open them with a lancet, if they hang much forth of the fundament, and be ſwollen with much bloud. But if they flow too immoderately, they may be ſtaid by the ſame means as the Courſes. How to provoke the *Hæmorhoids*.

CHAP. XXXIX.

Of procuring evacuation by ſtool, or a flux of the belly.

NAture oftentimes, both by its ſelf, of its own accord, as alſo helped by laxative and purging Medicins, caſts into the belly and guts, as into the ſink of the body, the whole matter of a peſtilent diſeaſe, whence are cauſed *Diarrhœas*, *Lienteries*, and *Dyſenteries*; you may diſtinguiſh theſe kinds of fluxes of the belly, by the evacuated excrements: For if they be thin and ſincere, that is, retain the nature of one, and that a ſimple humour, as of Choler, Melancholy, or Phlegm; and if they be caſt forth in a great quantity, without the ulceration or excoriation of the guts, vehement or fretting pain, then it is a *Diarrhœa*, which ſome alſo call *Fluxus Humoralis*. It is called a *Lienteria*, when as by the reſolved retentive faculty of the ſtomach and guts cauſed by ill humours, either there collected, or flowing from ſome 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 many and different things, and oft-times mixt with bloud, are caſt forth with pain, gripings, and an ulcer of the guts, cauſed by acrid choler, fretting in ſunder the coats of the veſſels. What a *Diarrhœa* is. What a *Dyſenteria* is.

But if in any kind of diſeaſe, certainly in a peſtilent one, fluxes of the belly happen immoderate in quantity, and horrible in the quality of their contents, as liquid, viſcous, frothy, as from melted greaſe, yellow, red, purple, green, aſh-coloured, black, and exceeding ſtinking. The cauſe is various, and many ſorts of ill humours, which taken hold of, by the peſtilent malignity, turn into divers ſpecies, differing in their whole kind, both from their particular, as alſo from Nature in general, by reaſon of the corruption of their proper ſubſtance, whoſe inſeparable ſign is ſtench, which is oft-times accompanied by Worms. The cauſe of various and ſtinking excrements in the Plague.

In the Camp at *Amiens*, a peſtilent Dyſentery was over all the Camp, in this the ſtrongeſt Souldiers purged forth meer bloud. I diſſecting ſome 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 *Cotyledons*, out of which as I preſſed them, there flowed bloud. For both by the exceſſive heat of the Summers Sun, and the minds of the enraged Souldiers, great quantity of acrid and cholerick humour was generated, and ſo flowed into the belly: but you ſhall know whether the greater or leſſer guts be ulcerated, better by the mixture of the bloud with the excrements, than by the ſite of the pain; therefore in the one you muſt rather work by Clyſters; but in the other by Medicins taken by the mouth. An Hiſtory.

Therefore, if by gripings, a *Teneſmus*, the murmuring and working of the guts, you ſuſpect in a peſtilent diſeaſe, that Nature endeavours to disburden it ſelf by the lower parts, neither in the mean while doth it ſucceed to your deſire, then muſt it be helped forward by Art, as by taking a potion of ℥ß. of *Hiera ſimplex*, and a dram of *Diaphœnicon* diſſolved in Wormwood water. A Potion.

Alſo Clyſters are good in this caſe, not onely for that they aſſwage the gripings and pains, and draw by continuation or ſucceſſion, from the whole body, but alſo becauſe 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 humours. In ſuch Clyſters they alſo ſometimes mix two or three drams of Treacle, that by one and the ſame labour they may retund the venenate malignity of the matter.

Suppositories. There may also be made for the same purpose Suppositories of boiled Honey, ℥ j. of *Hiera picra* and common Salt, of each ʒ ß. or that they may be the stronger, of Honey ℥ iij. of Ox-gall ℥ j. of Scammony, *Euphorbium*, and *Coloquintida* powdered, of each ʒ ß. The want of these may be supplied by *Nodulaes* made in this form: ℞ *Vitell. ovor.* nu. iij. *fellis bubuli, & mellis, an.* ℥ ß. *salis com.* ʒ ß. let them be stirred together, and well incorporated, and so parted into linnen rags, and then bound up into *Nodulaes* of the bigness of a Filberd, and so put up into the fundament; you may make them more acrid, by adding some powder of *Euphorbium* or *Coloquintida*.

CHAP. XL.

Of stopping the flux of the belly.

VIolent and immoderate scourings, for that they resolve the faculty, and lead the Patient into a consumption and death; if they shall appear to be such, they must be staid in time by things taken and injected by the mouth and fundament. To this purpose may a pudding be made of Wheat-flour boiled in the water of the decoction of one Pomgranat, Berberries, Bole-Armenick, *Terra sigillata*, and white Poppy-seeds, of each ʒ j. The following Almond-Milk strengthens the stomach, and mitigates the acrimony of the cholerick humour, provoking the guts to excretion. Take sweet Almonds boiled in the water of Barly, wherein Steel or Iron hath been quenched; beat them in a marble Mortar, and so with some of the same water, make them into an Almond-milk, whereto adding ʒ j. of *Diarrhodon Abbatis*, you may give it to the Patient to drink.

A hasty pudding to stay the lask.

This following Medicin I learnt of Dr. *Chappelain*, the Kings chief Physician, who received it of his Father, and held it as a great secret, and was wont to prescribe it with happy success to his Patients. It is thus: ℞ *Bol. Armen. terræ sigil. lapid. hæmat. an.* ʒ j. *picis navalis*, ʒ j. ß. *coral. rub. marg. electi. corn. cervi usti & liti in aq. plant. an.* ℈ j. *saccar. rosat.* ℥ ij. *fiat pulvis.* Of this let the Patient take a spoonful before meat, or with the yolk of an Egg.

D. *Chappelains* Medicin to stay a scouring.

Christopher Andrew in his *Oeconiatria*, much commendeth Dogs dung, when as the Dog hath for three days before been fed onely with bones.

Quinces roasted in Embers, or boiled in a Pot, the Conserve of Cornelian Cherries, Preserved Berberries and Myrabolans, roasted Nutmeg taken before meat strengthen the stomach and stay the lask; the Patient must feed upon good meats, and these rather roasted than boiled. His drink shall be Calibeate-water of the decoction of fowre Pomgranats beaten, or of the decoction of Quince, Medlars, Services, Mulberries, Bramble-berries, and the like things, endued with a faculty to bind and waste the excrementitious humidities of the body: these waters shall be mixed with syrup of red Currans, Julip of Roses, and the like.

Drink.

Let the region of the stomach and belly be anointed with Oil of Mastich, *Moschatelinum*, Myrtles, and Quince. Also cut of bread newly drawn forth of the Oven, and steeped in Vinegar and Rose-water may be profitably applied; or else a Cataplasm of red Roses, Sumach, Berberries, Myrtles, the pulp of Quinces, Mastich, Bean-flour, and the Honey of Roses made up with Calibeat-water.

Ointments.

Anodyne, abstergent, astringent, consolidating and nourishing Clysters shall be injected. These following retund the acrimony of humours, and assuage pain. ℞ *Fol. lactuc. hyosc. acetos. portul. an.* m. j. *flor. violar. & nenuph. an.* ℥ i. ß. *fiat clyster.* Or else, ℞ *Ros. rub. hord. mund. sem. plant. an.* p. j. *fiat decoctio, in colatura adde olei ros.* ℥ ij. *vitell. ovor.* ij. *fiat clyster.* Or, ℞ *Decoct. capi, crur. vitellin. & capit. vervecin. una cum pelle,* ℔ ij. *in qua coquantur fol. violar. malv. mercur. plantag. an.* m. j. *hord. mund.* ℥ j. *quatuor sem. frigid. major.* ℥ ß. *in colaturæ* ℔ ß. *dissolve cass. recenter extracti.* ℥ j. *el. viol.* ℥ iv. *vitell. ovor.* ij. *succ. rub.* ℥ j. *fiat clyster.* Or, ℞ *Flor. chamæm. melil. aneth. an.* p. j. *rad. bismal.* ℥ j. *fiat decoctio in lactis colaturæ adde mucag. sem. lin. fænugr. extracti in aqua malv.* ℥ ij. *saccar. rub.* ℥ j. *olei cham. & aneth. an.* ℥ j. ß. *vitellor. ovor.* ij. *fiat clyster.*

Clyster to stay a flux.

Such Clysters must be long kept, that they may more readily mitigate pain. When shaving of the guts appear in the stools, it is an argument that there is an ulcer in the guts; therefore then we must use detergent and consolidating Clysters, as this which follows:

A Clyster for ulcerated guts

℞ *Hordei integr.* p. ij. *ros. rub. flor. chamæm. plantag. apii, an.* p. j. *fiat decoctio, in colatura dissolve mellis rosat. & syr. de absinth. an.* ℥ j. ß. *vitel. ovor.* ij. This following Clyster consolidateth. ℞ *Succi plantag. centinod. & portulac. an.* ℥ ij. *bol. armen. sang. dracon. amyl. an.* ʒ j. *sevi hircini dissoluti,* ʒ iij. *fiat clyster.* Also Cows milk boiled with Plantain, and mixed with Syrup of Roses, is an excellent medicin for the ulcerated guts.

A very astringent Clyster.

This following Clyster binds. ℞ *Caud. equin. plantpolygon. an.* m. j. *fiat decoctio in lacte usitato ad* quart. iij. *& in colatura adde boli armen. sigil. sang. dracon.* ℥ ij. *albumina quatuor ovor. fiat clyster.* Or else, ℞ *Suc. plant. arnogloss. centinod. portulac. residentia facta depuratorum quantum sufficit pro clystere, addendo pul. bol. armen. terræ sigill. sang. drac. an.* ʒ j. *ol. myrrh. & rosat. an.* ℥ ij. *fiat clyster.*

If pure bloud flow forth of the guts, I could wish you to use stronger astrictives. To which purpose I much commend a decoction of Pomgranat pills, of Cypress nuts, red Rose-leaves, Sumach, Alum, and Vitriol made with Smiths water, and so made into Clysters, without any Oil. It will be good with the same decoction to foment the fundament, *perinæum*, and the whole belly.

Astringent Clysters ought not to be used before that the noxious humours be drawn away, and purged by purging Medicins, otherwise by the stoppage hereof, the body may chance to be oppressed.

A nourishing Clyster.

If the Patient be so weak that he cannot take or swallow any thing by the mouth, nutritive Clysters may be given him. ℞ *Decoctionis capi pinguis, & crur. vitulini, coct. cum acetosa, buglosso, boragine lactuc. pimpinella,* ℥ x. *vel* xij. *in quibus dissolve vitellos ovorum,* nu. iij. *saccari rosati, & aquæ vitæ, an.* ℥ j. *butyri recentis non saliti,* ʒ ij. *fiat clyster.*

CHAP.

CHAP. XLI.

Of evacuation by insensible transpiration.

THe pestilent malignity, as it is oft-times drawn by the pores, by transpiration into the body, so oft-times it is sent forth invisibly the same way again. For our native heat, that is never idle in us, dispersеth the noxious humours, attenuate into vapours and air through the unperceivable breathing-places of the skin. An Argument hereof is, we see that the tumors and abscesses against Nature, even when they are come to suppuration, are oft-times resolved and discussed by the onely efficacy of Nature, and Heat, without any help of Art: Therefore there is no doubt but that Nature, being prevalent, may free it self from the pestilent malignity by transpiration, some Abscess, Bubo, or Carbuncle being come forth, and some matter collected in some certain part of the body: For when as Nature and the native heat are powerful and strong, nothing is impotible to it, especially when the passages are also in like manner free and open.

Tumors are oft-times 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 be infected with the Pestilence, they must be cured after another order than is yet described. The Nurse of the sucking child must govern her self so in Diet, and the use of Medicins, as if she were infected with the Pestilence her self: Her Diet consisteth in the use of the six things *Not natural*. Therefore let it be moderate; for the fruit or profit of that moderation in Diet cannot chuse but come 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 he can, in sleep, waking, and expulsion, or avoiding of superfluous humours and excrements of the body. Let the Nurse be fed with those things that mitigate the violence of the feverish heat: as cooling broths, cooling herbs, and meats of a moderate temperature: she must wholly abstain from Wine, and anoint her Nipples as often as she giveth the Infant suck, with water or juice of Sorrel tempered with Sugar of Roses. But the Infants heart must be fortified against the violence of the increasing venom, by giving it one scruple of Treacle in Nurses milk, the broth of a Pullet, or some other cordial Water. It is also very necessary to anoint the region of the heart, the emunctories, and both the wrists with the same Medicin: neither were it unprofitable to smell often unto Treacle dissolved in Rose-water, Vinegar of Roses, and a little *Aqua Vitæ*, that so Nature may be strengthened against the malignity of the venom. When the children are weaned, and somewhat well grown, they may take Medicins by the mouth; for when they are able to concoct and turn into bloud meats that are more gross and firm than Milk, they may easily actuate a gentle Medicin. Therefore a potion must be prepared for them of twelve grains of Treacle dissolved with a little of the Syrup of Succory in some cordial Water, or the broth of a Capon: unless that any had rather give it with Conserve of Roses, in form of a Bole: but Treacle must be given to children in very small quantity, for if it be taken in any large quantity, there is great danger left that by inflaming the humours, it infer a Fever. Furthermore, Broth may be prepared to be 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, being tied in a rag, and sometimes pressed out from the decoction. For Bole-Armenick, whether it be by its marvellous faculty of drying, or by some hidden property, hath this virtue, that being drunken (according as *Galen* witnesseth) it cureth those that are infected with the Pestilence, if so be that they may be cured by Physick; so that those that cannot be cured with Bole-Armenick, cannot be preserved by any other Medicins. But because the bodies of children are warm, moist, and vaporous, they are easily delivered of some portion of the venenate matter through the pores of the skin, by provoking sweat with a decoction of Parsly-seeds, Prunes, Figs, and the Roots of Sorrel, with a little of the powders of Harts-horn, or Ivory. But that the sweat may be more abundant and copious, apply sponges dipped and pressed out in the hot decoction of Sage, Rosemary, Lavender, Bays, Cammomil, Melilot, and Mallows, or else Swines bladders half filled with the same decoction, to the arm-holes, and to the groins. In the time that they sweat, let their Faces be fanned to cool them. Also let a Nodula of Treacle, dissolved in Vinegar and water of Roses, be applied to the Nostrils, but always use a moderation in sweating, because that children are of a substance that is easie to be dissipated and resolved: so that oftentimes, although they do not sweat, yet they feel the commodities of sweating, the matter of the venom being 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 be recreated and strengthened, which otherwise would be debilitated through sweating, that it may be better able to expel the venom. After that the sweat is wiped away, it were very profitable to take a potion of Conserve of Roses, with the powder of Harts-horn or Ivory, dissolved in the waters of Buglos and Sorrel, the better to cool and defend the heart. If there appear any tumour under the arm-holes, or in the groin, let it be brought to maturation with mollifying relaxing, drawing, and then with a suppurative fomentation, or Cataplasm; always using and handling it as gently as you may, considering the age of the Infant. If you have need to purge the Patient, the purgation following may be prescribed with great profit. Take of Rhubarb in powder one dram, infuse it in the water of *Carduus Benedictus*, with one scruple of Cinamon, in the straining dissolve two drams of *Diacatholicon*, of syrup of Roses laxative three drams: make thereof a small potion. This is the cure

The Nurse must be dieted when as the child is sick.

Medicins may be given to such as are weaned.

Lib. 9 simp. c. 74.

The benefit of children.

The form of a Purge to be given to a child.

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; of whom alone, as the Author of all good things that mortal men enjoy, the true and certain Preſervatives againſt the Peſtilence, are to be deſired and hoped for.

The End of the Two and Twentieth Book.

BOOK XXIII.

Of the Means and Manner to repair or ſupply the Natural or Accidental Defects or Wants in Mans Body.

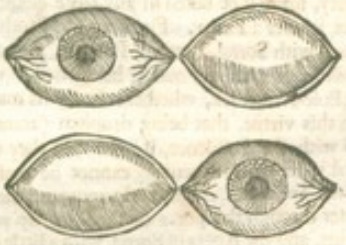
CHAP. I.

How the loſs of the Natural or true Eye may be covered, hidden or ſhadowed.

The fourth duty of a Chirurgeon.

HAving at large treated in the former Books of Tumors, Wounds, Ulcers, Fractures, and Luxations, by what means things diſſolved and diſlocated might be united, things united ſeparated, and ſuperfluities conſumed or abated: Now it remains, that we ſpeak of the fourth Office or Duty of the Chirurgeon, which is to ſupply or repair thoſe things that are wanting by Nature, through the default of the firſt conformation, or afterwards by ſome miſchance. Therefore if that through any miſchance, as by any inflammation, any mans Eye happen to be broken or put out, and the humours ſpilt or waſted; or if it be ſtrucken out of its place or cavity wherein it was naturally placed by any 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 Eye, yet you may cover the deformity of the Eye 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 Eye artificially made of Gold or Silver, counterfeited and enamelled, ſo that it may ſeem to have the brightneſs or gemmy decency of the natural Eye, into the place of the Eye that is ſo loſt.

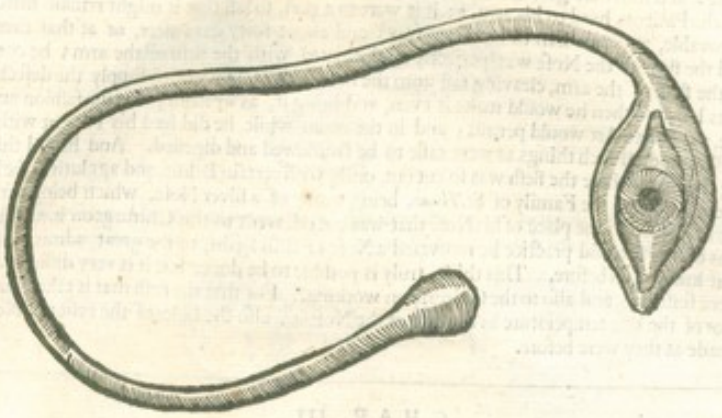
The Forms of Eyes artificially made of Gold or Silver, poliſhed and enamelled, ſhewing both the inner and outer ſide.



But if the Patient be unwilling, or by reaſon of ſome other means, cannot wear this Eye ſo prepared, in his head, you may make another on this wiſe. You muſt have a ſtring or wire of Iron bowed or crooked, like unto womens Ear-wires, made to bind the head harder or looſer, as it pleaſeth the Patient, from the lower part of the head behind above the ear, unto the greater corner of the Eye; this rod or wire muſt be covered with ſilk, and it muſt alſo be ſomewhat broad at both ends, leſt that the ſharpneſs thereof ſhould pierce or prick any part that it cometh unto. But that end wherewith the empty hollowneſs muſt be covered, ought to be broader than the other, and covered with a thin piece of leather, that thereon the colours of the eye that is loſt may be ſhadowed or counterfeited. Here followeth the Figure or portraiture of ſuch a ſtring or wire.

The

The form of an Iron Wier wherewith the deformity of an eye that is loſt, may be ſhadowed or covered.



CHAP. II.

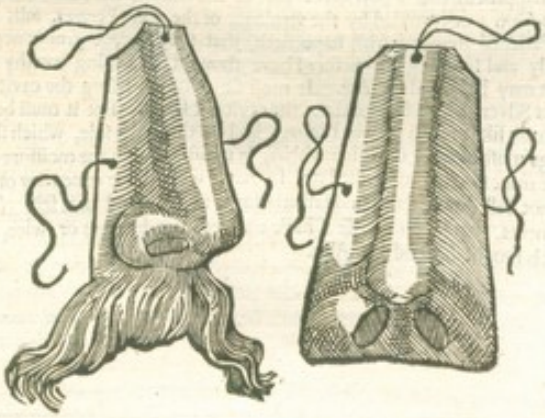
By what means a part of the Noſe that is cut off, may be reſtored; or how in ſtead of the Noſe that is cut off, another counterfeit Noſe may be faſtned, or placed in the ſtead.

WHen the whole Noſe is cut off from the Face, or portion of the Noſtrils, from the Noſe, it cannot be reſtored or joined 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 be conſumed or waſted: for when the boughs or branches of Trees are broken, torn or cut away, the live nevertheleſs, and will grow again when they are ſet and grafted; neither is there any ſeat for the heart rightly prepared in them from whence the heat muſt neceſſarily run, and diſperſe 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; becauſe they have their nouriſhment, life, ſenſe, and whole ſuſtentation not of themſelves, by faculties flowing or coming unto them from ſome other parts; neither are they governed by their own heat, as Plants, but by a borrowed heat: ſo that above or beſide the natural faculty of the liver, another vital faculty cometh unto it from the heart.

Why the parts of Plants being cut off, may grow again, but thoſe of Mans cannot.

Wherefore inſtead of the Noſe cut away or conſumed, it is requiſite to ſubſtitute another made by Art, becauſe that Nature cannot ſupply that defect: this Noſe ſo artificially made, muſt be of Gold, Silver, Paper, or linnen cloths glewed together, it muſt be ſo coloured, counterfeited, and made both of faſhion, figure and bigneſs, that it may as aptly as is poſſible, reſemble the natural Noſe: it muſt be bound or ſtaid with little threds or laces unto the hinder part of the head or the hat. Alſo if there be any portion of the upper lip cut off with the noſe, you may ſhadow it with annexing ſome ſuch thing that is wanting unto the noſe, and cover it with the hair on his upper lip, that he may not want any thing that may adorn or beautifie the face. Therefore I have thought it neceſſary to ſet down the figure or form of both theſe kinds.

The form of a Noſe artificially made, both alone by it ſelf, and alſo with the upper lip covered with the hair of the Beard.



There

A ſtrange cure for a cut off Noſe.

There was a Surgeon of *Italy* of late years which would reſtore or repair the portion of the Noſe that was cut away, after this manner. He firſt ſcarified the callous edges of the maimed Noſe round about, as is uſually done in the cure of Hare-lips: then he made a gaſh or cavity 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 cavity ſo made, he would put that part of the Noſe ſo wounded, and bind the Patients head to his arm, as if it were to a poſt, ſo faſt that it might remain firm, ſtable and immovable, and not lean or bow any way; and about forty days after, or at that time when he judged the fleſh of the Noſe was perfectly agglutinated with the fleſh of the arm; he cut out as much of the fleſh of the arm, cleaving faſt unto the noſe, as was ſufficient to ſupply the defect of that which was loſt, and then he 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 he did feed his Patient with Panadoes, Gellies, and all ſuch things as were eaſie to be ſwallowed and digeſted. And he did this work of curing the place where the fleſh was ſo cut out, onely with certain Balms, and agglutinative liquors.

An Hiſtory.

A younger Brother of the Family of St. *Thoan*, being weary of a ſilver Noſe, which being artificially made, he had worn in the place of his Noſe that was cut off, went to this Chirurgeon into *Italy*, and the means of the foreſaid practice he recovered a Noſe of fleſh again, to the great admiration of all thoſe that knew him before. This thing truly is poſſible to be done, but it is very difficult both to the Patient ſuffering, and alſo to the Chirurgeon 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 be made as they were before.

CHAP. III.

Of the placing of Teeth artificially made, inſtead of thoſe that are loſt or wanting.

IT oftentimes happeneth that the fore-teeth are moved, broken or ſtricken out of their places by ſome violent blow, which cauſeth deformity of the mouth, and hinders 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 Ivory may be put in the place of thoſe that are wanting, and they muſt be joined one faſt unto another, and alſo ſo faſtned unto the natural teeth adjoining, that are whole: and this muſt chiefly be done 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. 15.

The Figure of Teeth bound or faſtned together.

CHAP. IV.

Of filling the hollowneſs of the Palat.

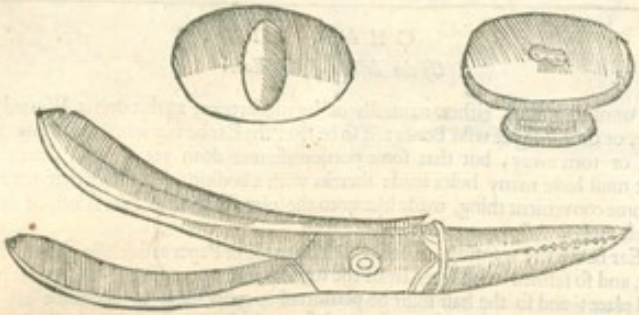
The cauſes and hurt that enſues of the loſt Palat.

MAny times it happeneth that a portion or part of the bone of the Palat, being broken with the ſhot of a Gun, or corroded by the virulency of the *Lues Venerea*, falls away; which makes the Patients, to whom this happeneth, that they cannot pronounce their words diſtinctly, but obſcurely and ſnuffling: therefore I have thought it a thing worthy the labour, to ſhew the means how it may be helped by Art. It muſt be done by filling the cavity of the Palat with a Plate of Gold or Silver, a little bigger than the cavity it ſelf is. But it muſt be as thick as a French Crown, and made like unto a diſh in Figure; and on the upper ſide, which ſhall be toward the brain, a little Sponge muſt be faſtned, which when it is moiſtned with the moiſture diſtilling from the brain, will become more ſwollen and puffed up, ſo that it will fill the concavity 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

The Figure of Plates to fill or supply the defects of the Palat.

The Figure of another Plate of the Palat, on whose upper side there is a button, which may be turned when it is put into its place, with a small Ravens bill, like this whose Figure is here expressed.



CHAP. V.

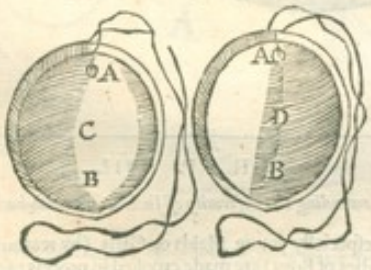
How to help such as cannot speak by reason of the loss of some part of the Tongue.

CHance gave place and authority to this remedy, as to many other in our Art. A certain man dwelling in a Village named *Troy le Chasteau*, being some four and twenty mile from *Bourges*, had a great piece of his tongue cut off; by which occasion he remained dumb some three years. It happened on a time that he was in the Field with Reapers, he drinking in a woodden dish was tickled by some of the standers by, not enduring the tickling, he suddenly broke out into articulate and intelligible words. He himself wondring thereat, and delighted with the novelty of the thing, as a miracle, put the same dish to his mouth just in the same manner as before, and then he spake so plainly and articulately, that he might be understood by them all. Wherefore a long time following he always carried this dish in his bosom to utter his mind, until at length Necessity, the Mistriss of Arts and giver of Wit, inducing him, he caused a woodden instrument to be neatly cut and made for him, like that which is here delineated, which he always carried hanging at his neck, as the onely Interpreter of his mind, and the Key of his Speech.

A remedy found out by accident.

An History.

An Instrument made to supply 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 he did so hold between his cutting teeth, that it could not come out of his mouth, nor be seen. *B* Sheweth the lower part, as thick as a Six-pence, which he did put hard to the rest of his tongue, close to the membranous ligament which is under the tongue. That place which is depresst and somewhat hollowed, marked with the letter *C*, is the inner part of the instrument. *D* Sheweth the out-side of the same. He hanged it about his neck with the string that is tied thereto.

Textor the Physician of *Bourges* shewed me this Instrument: and I my self made trial thereof on a young man whose tongue was cut off, and it succeeded well, and took very good effect. And I think other Surgeons in such cases may do the like.

CHAP.

CHAP. VI.

Of covering or repairing certain defects or defaults in the face.

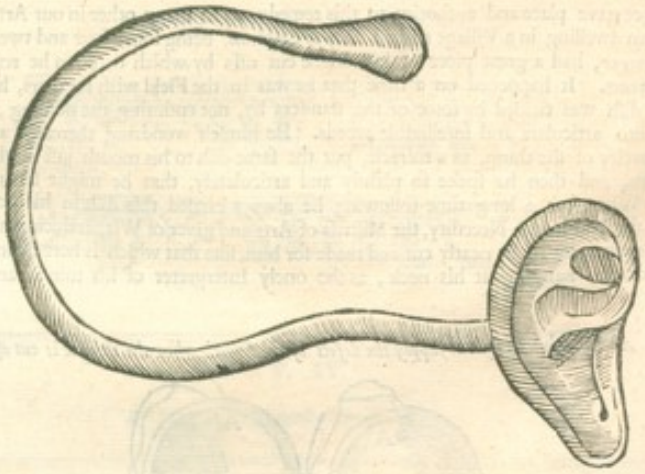
IT oftentimes happeneth, that the face is deformed by the ſudden flaſhing of Gun-powder, or by a peſtilent Carbuncle, ſo that one cannot behold it without great horrour. Such perſons muſt be ſo trimmed and ordered, that they may come in ſeemly manner into the company of others. The lips if they be either cut off with a ſword, or deformed with the eroſion or eating of a peſtilent Carbuncle or ulcerated Cancer, ſo that the teeth may be ſeen to lie bare with great deformity. If the loſs or conſumption of the lip be not very great, it may be repaired by that way which we have preſcribed in the cure of hare-lips, or of an ulcerated Cancer. But if it be great, then muſt there be a lip of gold made for it, ſo ſhadowed and counterfeited, that it may not be much unlike in colour to the natural lip, and it muſt be 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 biting of wild Beaſts: if ſo be that the Ear be not wholly wanting, waſted, conſumed, or torn away; but that ſome portion thereof doth yet remain, then muſt it not be neglected, but muſt have many holes made therein with a bodkin; and after that the holes are cicatrized, let ſome convenient thing, made like unto the piece of the Ear that is loſt, be tied or faſtned unto it by theſe holes.

But if the Ear be wholly wanting, another muſt be made of Paper artificially glewed together, or elſe of leather, and ſo faſtned with laces, from the top or hinder part of the head, that it may ſtand in the appointed place; and ſo the hair muſt be permitted to grow long, or elſe ſome cap worn under the hat, which may hide or cover the deformity, unleſs you had rather have it to be ſhadowed or counterfeited by ſome Painter, that thereby it may reſemble the colour of a natural Ear; and ſo retain it in the place where it ought to ſtand, with a rod or wier coming from the top or hinder part of the head, as we have ſpoken before in the loſs of the Eye: and the form thereof is this.



CHAP. VIII.

Of amending the deformity of ſuch as are crook-backt.

Cauſes of crookedneſs.

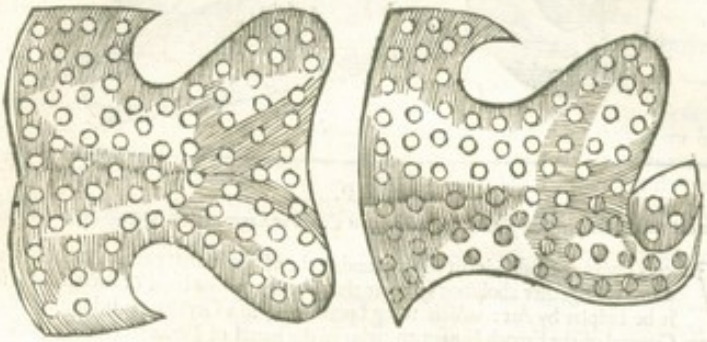
THe bodies of many, eſpecially young Maids or Girls (by reaſon that they are more moiſt and tender then the bodies of Boys) are made crooked in proceſs of time, eſpecially by the wrenching aſide and crookedneſs of the back-bone. It hath many cauſes, that is to ſay, in the firſt conformation in the womb, and afterwards by misfortune; as a fall, bruiſe, or any ſuch like accident; but eſpecially by the unhandſome 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, writing, or in doing any ſuch like thing.

In the mean while, that I may not omit the occaſion of crookedneſs, that happens ſeldom to the Country 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 folly of Mothers, who while they covet to have their young daughters bodies ſo ſmall in the middle as may be poſſible, pluck and draw their bones awry, and make them crooked. For the ligaments of the back-bone being very tender, ſoft and moiſt at that age, cannot ſtay it ſtraight and ſtrongly,

ſtrongly; but being pliant, eaſily permits the ſpondels to ſlip awry inwards, outwards, or ſidewiſe, as they are thruſt or forced.

The remedy for this deformity is to have breſt-plates of Iron, full of holes all over them, whereby they may be lighter to wear; and they muſt be ſo lined with bombaſte that they may hurt no place of the body. Every three moneths new plates muſt be made for thoſe that are not yet arrived at their full growth; for otherwiſe by the daily afflux of more matter, they would become worſe. But theſe Plates will do them ſmall good that are already at their full growth.

The form of an Iron Breſt-plate, to amend the crookedneſs of the Body.

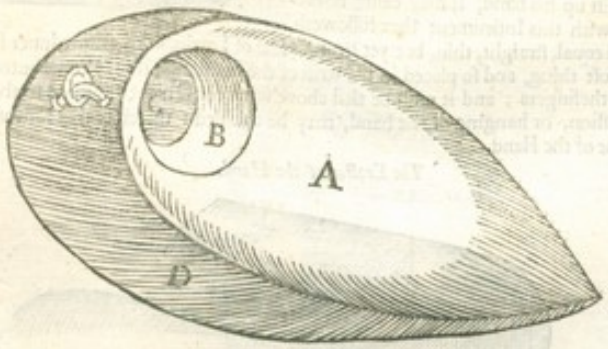


CHAP. IX.

How to relieve ſuch as have their Urin flow from them againſt their wills, and ſuch as want their Yards.

IN thoſe that have the Strangury, of what cauſe ſoever that malady cometh, the urin paſſeth from them by drops, againſt their wills and conſent. This accident is very grievous and troubleſom, eſpecially to men that travel: 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 be of Lattin, and to contain ſome four ounces: it muſt be put into the Patients hoſe, betwixt his thighs, unto which it muſt be 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 concavity or hollowneſs goeth a ſtay ſomewhat 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 urin from going back again when it is once in. But the letters A and D, do ſignifie all the inſtrument; that, the former part, this the hinder part thereof. Now this is the ſhape thereof. An Inſtrument for ſuch as cannot hold their Water.

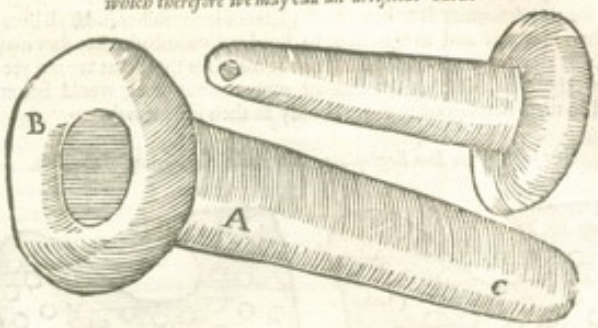
The Figure of an Inſtrument, which you may call a Baſin, *or Receptacle for the Urin.*



Thoſe that have their Yards cut off cloſe to their bellies, are greatly troubled in making of Urin, ſo that they are conſtrained to ſit down like women. For their eaſe, I have deviſed this Pipe or Conduit, having an hole through it as big as one finger, which may be made of Wood, or rather of Lattin.

A and C do ſhew the bigneſs and length of the Pipe. B Sheweth the brink on the broader end. D Sheweth the outſide of the brink. This Inſtrument muſt be applied to the lower part of *Oſ pectinis*: on the upper end it is encompaſſed with a brink for the paſſage of the Urin, for thereby it will receive the Urin better, and carry it from the Patient as he ſtandeth upright.

The deſcription of a Pipe or Conduit, ſerving in ſtead of the Yard in making of water, which therefore we may call an artificial Yard.



CHAP. X.

By what means the periſhed function or action of a thumb or finger may be corrected and amended.

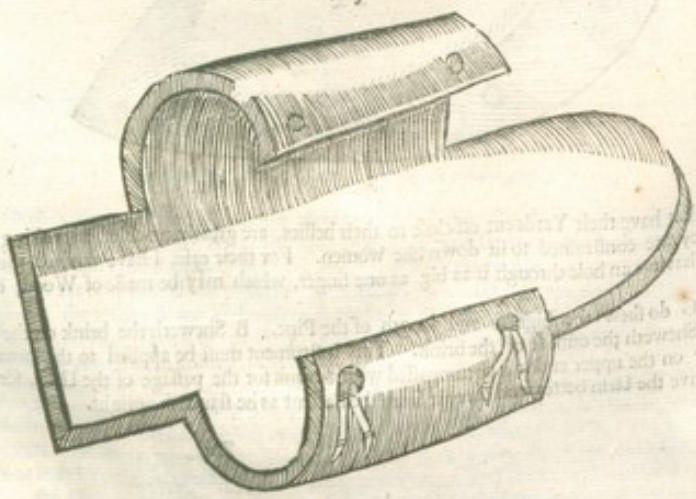
An Hiſtory.

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 be holpen by Art: which thing I performed in a Gentleman belonging to *Annas* of *Montmorency*, General of the French Horſemen, who in the battel of *Dreux* received ſo great a wound with a Back-ſword upon the outſide 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 he 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 he could hold neither Sword, Spear, nor Javelin in his hand, ſo that he was altogether unprofitable for War, without which he ſuppoſed there was no life. Wherefore he conſulted with me about the cutting away of his Thumb, which did hinder his gripings, which I refuſed to do, and told him that I conceived a means how it might be remedied without cutting away. Therefore I cauſed a caſe to be made for it of Lattin, whereinto I put the Thumb: this caſe was ſo artificially faſtned 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 he was able afterwards to handle any kind of weapon.

The form of a Thumb or Finger-ſtall of Iron or Lattin, to lift up or erect the Thumb, or any other Finger that cannot be erected of it ſelf.

If that in any man the ſinews or tendons which hold the hand upright, be cut aſunder with a wound, ſo that he is not able to lift up his hand, it may eaſily be erected or lifted up with this Inſtrument that followeth, being made of an equal, ſtraight, thin, but yet ſtrong plate of Lattin, lined on the inner ſide with ſilk, or any ſuch like ſoft thing, and ſo placed in the wriſt of the hand, that it may come unto the Palm, or the firſt joints of the fingers; and it muſt be tied above with convenient ſtays, and ſo the diſcommodity of the depreſſion, or hanging of the hand, may be avoided: therefore this Inſtrument may be called the Erector of the Hand.

The Erector of the Hand.



CHAP.

CHAP. XI.

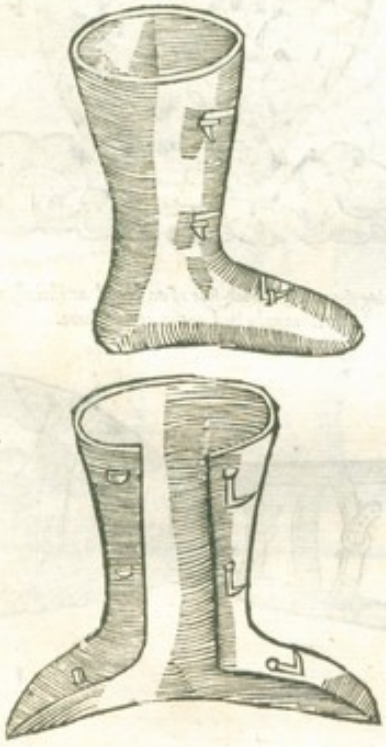
Of helping those that are Vari *or* Valgi, *that is, crook-legged, or crook-footed, inwards or outwards.*

THose that are said to be *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 because that in the time when she is great with child, she commonly sits with her legs across; or else after the child is born, and that either because his legs be not well swathed when he is laid into the Cradle, or else because they be not well placed in carrying the infant; or if he be not well looked unto by the Nurse when he learneth to go: for the bones are very tender, and almost as flexible as Wax. What *Varus* is.

But contrariwise, those are called *Valgi* whose legs are crooked or bowed outwards. This may come through the default of the first conformation as well as the other; for by both, the feet also and the knees may be made crooked; which thing whosoever will amend, must restore the bones into their proper and natural place; so that in those that are *varous*, he must thrust the bones outwards, as though he would make them *valgous*: neither is it sufficient to thrust them so, but they ought also to be retained there in their places after they are so thrust, for otherwise they being not well established, would slip back again. What *Valgus* is.

They must be staid in their places, by applying of collars and bolsters on that side whereunto the bones do lean and incline themselves; for the same purpose boots may be made of leather, of the thickness of a testone, having 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 be the better fitted and sit closer to the leg. And let this Medicin following be applied all about the leg. ℞ *Thuris, mastich. aloes, boli armeni, an.* ℥ j. *aluminis roch. resinæ pini siccæ, subtilissime pulveris. an.* ʒ iij. *farinæ volat.* ℥ j. ʃ. *albumen ovor. q. s.* make thereof a Medicin. You may also add a little Turpentine, lest it should dry sooner, or more vehemently than is necessary. But you must beware, and take great heed, lest that such as were of late *varous* or *valgous*, should attempt or strain themselves to go before that their joints be 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 shoes tied close to their feet, that the bones may be staid the better and more firmly in their places; but let that side of the soal of the shoe be under-laid whither the foot did incline before it was restored. A Plaister to hold fast restored bones.

The Form of little Boots, whereof the one is open and the other shut.



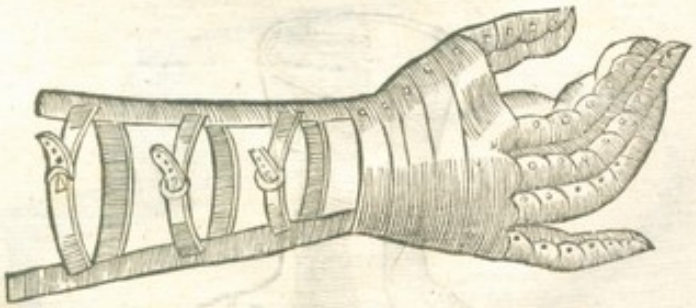
CHAP. XII.

By what means Arms, Legs, and Hands may be made by Art, and placed in stead of the natural Arms, Legs, or Hands that are cut off and lost.

NEcessity oftentimes constrains us to find out the means whereby we may help and imitate Nature, and supply the defect of members that are perished and lost. And hereof it cometh that we may perform the functions of going, standing and handling with Arms and Hands made by Art, and undergo our necessary 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 ingenious and excellent Smith dwelling at *Paris*, who is called of those that know him, and also of strangers, by no other name than the Little *Lorain*; and here I have caused them to be pourtraid, or set down, that those that stand in need of such things, after the example of them, may cause some Smith, or such like Workman, to serve them in the like case. They are not onely profitable for the necessity of the body, but also for the decency and comelinesse thereof. And here follow their forms.

The form of an Hand made artificially of Iron.

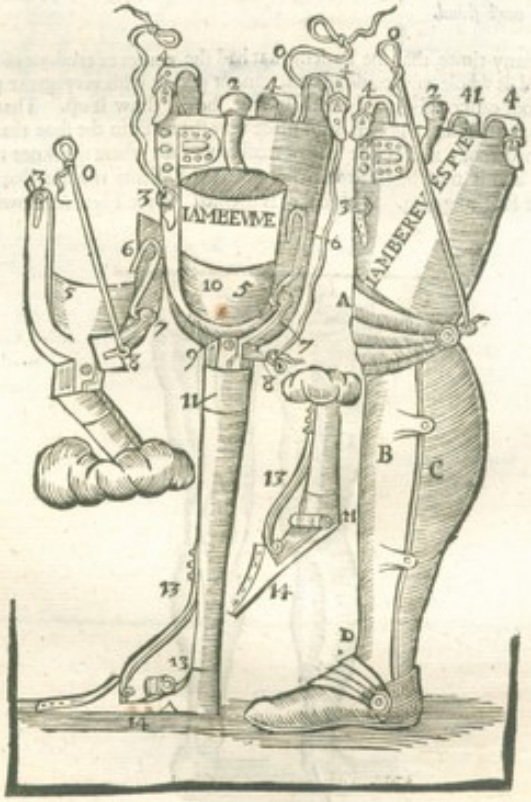
This Figure following sheweth the back-side of an Hand artificially made, and so that it may be tied to the arm or sleeve.



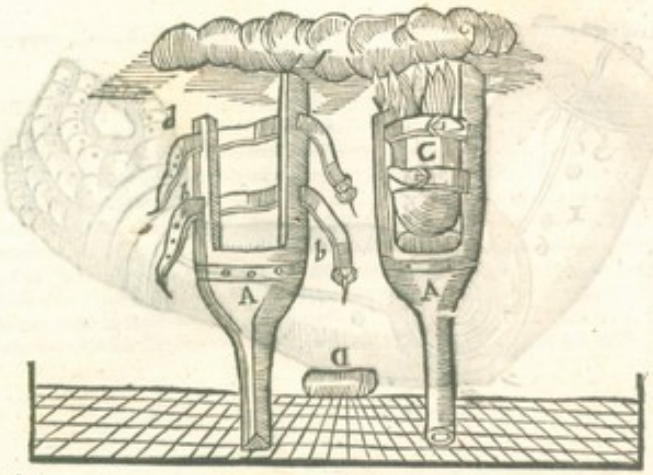
The

The Form of an Arm made of Iron very artificially.

The description of Legs made artificially of Iron.



The Form of a Woodden Leg made for poor Men.



A *Sheweth the ſtump or ſtock of the woodden Leg.* B B *Sheweth the two ſtays which muſt be on both ſides of the Leg, the ſhorter of them muſt be on the inner ſide.* C C *Sheweth the Pillow or Bolſter whereon the Knee muſt reſt in the bottom between the two ſtays, that ſo it may reſt the ſofter.* D D *Sheweth the thongs or girths with their round buckles put through the two ſtays on either ſide to ſtay the Knee in his place firm and immovable, that it ſlip not aſide.* E *Sheweth the thigh it ſelf, that you may know after what faſhion it muſt ſtand.*

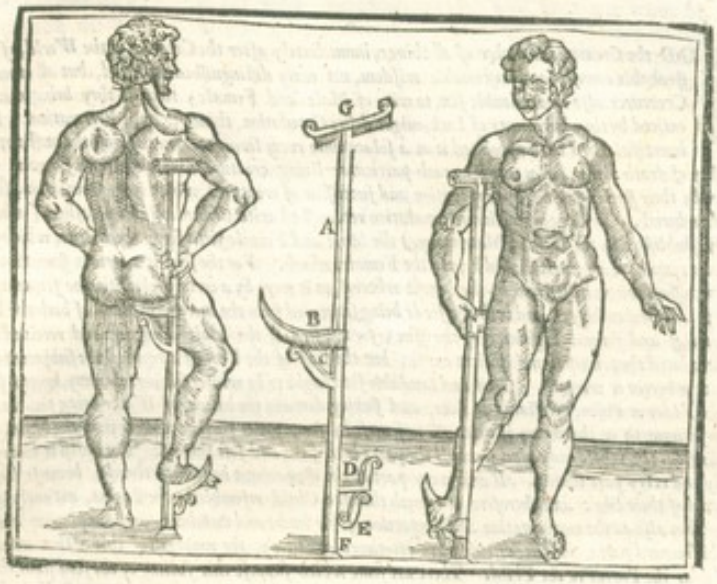
It happens alſo many times, that the Patient that had the nerves or tendons of his Leg wounded, long after the wound is whole and conſolidated, cannot go but with very great pain and torment, by reaſon that the foot cannot follow the muſcle that ſhould draw it up. That this malady may be remedied, you ought to faſten a linnen band made very ſtrong unto the ſhoe that the Patient weareth on that his pained foot; and at the knee it muſt have a ſlit where the knee may come forth in bowing of the Leg: and it muſt be truſſed up faſt unto the Patients 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 A A.

CHAP.

CHAP. XIII.

Of amending or helping of Lameneſs or Halting.

HAlting is not onely a great deformity, but alſo very troubleſom and grievous. Therefore if that any be grieved therewith by reaſon that one of his legs is ſhorter than the other, it may be holpen by putting under his ſhort foot this fitting Crutch, which we are now about to deſcribe. For by the help of this, he ſhall not onely go upright, but alſo more eaſily and with little labour or no pain at all. It was taught me by *Nicolas Piccard* Chirurgeon to the Duke of *Lorain*. The Form thereof is this:



A *Sheweth the ſtaff or ſtilt of this Crutch, which muſt be made of Wood.* B *Sheweth the Seat of Iron whereon the thigh reſteth, juſt under the buttock.* C *Sheweth a prop which ſtayeth up the ſeat whereon all the weight of the Patients body reſteth.* D *Sheweth the ſtirrup, being 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 ſtayeth or holdeth up the ſtirrup to ſtrengthen it.* F *Sheweth the foot of the ſtilt or crutch made of Iron with many 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 be ſeen in the Figure.*

The End of the Three and Twentieth Book.

BOOK

BOOK XXIV.

Of the GENERATION *of* MAN.

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 mankind, but all other living Creatures also into a double sex, to wit, of Male and Female; that so they being 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 every living creature against the most certain and fatal necessity of death: then for as much as each particular living creature cannot continue for ever, yet they may endure by their species or kind, 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 Matrimony,) the Male and Female yield forth their seeds, which presently mixed and conjoined, are received and kept in the Females womb. For the seed is a certain spumous or foamy humour replenished with vital spirit, by the benefit whereof, as it were by a certain ebullition or fermentation, it is puffed up, and swollen bigger, and both the seeds being 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 being 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 wherein it worketh. Good and laudable seed ought to be white, shining, clammy, knotty, smelling like unto the Elder or Palm, delectable to Bees, and sinking down in the bottom of Water being put into it, for that which swimmeth on the water is esteemed unfruitful; for a great portion cometh from the brain, yet some thereof falls from the whole body, and from all the parts both firm and soft thereof. For unless it come from the whole body and every part thereof, all and every part of the issue cannot be formed thereby, because like things are engendred of their like: and therefore it cometh that the Child resembleth the Parent, not onely in stature and favour, 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 hereditary, the weakness of this or that entrail being translated from the Parent to the Child. There are some which suppose this falling of the seed from the whole body not to be 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, being the framers of formation and life, and also the formative faculty to fall down from all the parts into the seed, that is wrought or perfected by the Testicles; for proof and confirmation whereof, they alledge that many 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 body.

Wherefore many diseases are hereditary.

How seed is to be understood to fall from the whole body.

CHAP. XXIX.

Why the generative parts are endued with great pleasure.

What moveth a man to copulation.

A Certain great pleasure accompanieth the function of the parts appointed for generation; and before it in living Creatures that are of a lusty age, when matter aboundeth in those parts, there goeth a certain fervent or furious desire: the causes thereof many, of which the chiefest is, That the kind may be preserved and kept for ever, by the propagation and substitution of other living creatures of the same kind. For brute Beasts which want reason, and therefore cannot be solicitous for the preservation of their kind, never come to carnal copulation unless they be moved thereunto by a certain vehement provocation of unbridled Lust, and as it were by the stimulation of Venery. But Man that is endued with reason, being a divine and most noble creature, would never yield nor make his mind so subject to a thing so abject and filthy as is carnal copulation, but that the venereous ticklings, raised in those parts, relax the severity of his mind; or Reason admonisheth him that the memory of his name ought not to end with his life, but to be preserved unto all generations, as far as may be possible, by the propagation of his seed or issue. Therefore by reason of this profit or commodity, Nature hath endued the genitals with a far more exact or exquisite sense than the other parts, by sending the great sinews unto them, and moreover she hath caused them to be bedewed or moistned with a certain whayish humour, 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 sharpness or biting, for that kind of humour of all others can chiefly provoke those parts to their function or office, and yield them a delectable pleasure, while they are in execution of the same. For even so whayish and sharp humours, when they are gathered together under the skin, if they wax warm, tickle with a certain pleasant itching, and by their motion inffer 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 humours, abounding either in quantity or quality only, but a certain great and hot spirit or breath contained in those parts, doth begin to dilate it self more and more, which causeth a certain incredible excess of pleasure or voluptuousness, wherewith the genitals

genitals being replete, are ſpread forth or diſtended every way unto their full greatneſs. The Yard is given to Men whereby they may caſt out their ſeed directly or ſtraitly into the Womans womb; to Women whereby they may receive 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 artery lying below, do make many flexions or windings, yet one as many as the other, like unto the tendrils of Vines diverſly platted or folded together, and in thoſe 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 for as much as they are looſe, thin, and ſpongeous, or hollow, receiving the humour which was begun to be concocted in the fore-named veſſels, concoct it again themſelves: but the Teſticles of Men concoct the more perfectly for the procreation of the iſſue, and the teſticles of Women more imperfectly, becauſe they are more cold, leſs, weak, and feeble, but the Seed becometh white by the contact or touch of the Teſticles, becauſe the ſubſtance of them is white. The male is ſuch as engendereth in another, and the female in her ſelf, by the ſpermatick veſſels which are implanted in the inner capacity of the womb. But out of all doubt, unleſs Nature had prepared ſo many allurements, baits, and provocations of pleaſure, there is ſcarce any man ſo hot and delighted in venerous acts, which conſidering and marking the place appointed for humane conception, the loathſomneſs of the filth which daily falleth down into it, and wherewithall it is humected and moiſtned, and the vicinity and nearneſs of the great gut under it, and of the bladder above it, but would ſhun the embraces of Women. Nor would any Woman deſire the company of Man, which once premeditates or fore-thinks with her ſelf on the labour that ſhe ſhould ſuſtain in bearing in the burthen of her child nine Moneths, and of the almoſt deadly pains that ſhe ſhall ſuffer in her delivery.

The cauſe of folding of the ſpermatick veſſels.

Womens Teſticles more imperfect.

Why many men and women abhor venerous copulapulation.

Men that uſe too frequent copulation, oftentimes in ſtead of ſeed caſt forth a crude and bloudy humour, and ſometimes meer bloud it ſelf; and oft-times they can hardly make water but with great pain, by reaſon that the clammy and oily moiſture, which Nature hath placed in the glandules called the *Proſtatæ*, to make the paſſage of the urin ſlippery, and to defend it againſt the ſharpneſs of the urin that paſſeth through it, is waſted, ſo that afterward they ſhall ſtand in need of the help of a Surgeon to cauſe them to make water with eaſe 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 impetuoſity, his Yard being ſtiff and diſtended, and the Woman to receive the ſame without delay into her womb being wide open, leſt that through delay the ſeed wax cold, and ſo become 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 allures or draws the maſculine ſeed into it ſelf by the mouth thereof, and it receives the womans ſeed by the horns from the ſpermatick veſſels which come from the Teſticles into the hollowneſs or concavity of the womb, that ſo it may be tempered by conjunction, commiſtion and confuſion with the mans ſeed, and ſo reduced or brought unto a certain equality: for generation or conception cannot follow without the concourſe of two ſeeds, well and perfectly wrought in the very ſame moment of time, nor without a laudable diſpoſition of the womb both in temperature and complexion: if in this mixture of ſeeds the mans ſeed in quality and quantity exceed the womans, it will be a man-child; if not, a woman-child, although that in either of the kinds there is both the mans and womans ſeed: as you may ſee by the daily experience of thoſe men who by their firſt wives have had boys 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 always like affected to get a man or woman-child; for by reaſon of his age, temperature and diet, he doth ſometimes yield forth ſeed endued with a maſculine virtue, and ſometimes with a feminine or weak virtue, ſo that it is no marvel if men get ſometimes men and ſometimes women-children.

Why the Strangury enſueth immoderate copulation.

What things neceſſary unto generation.

Why a male, and why a female is engendred.

CHAP. II.

Of what quality the Seed is, whereof the male, and whereof the female is engendred.

MAle Children are engendred of a more hot and dry ſeed, and women of a more cold and moiſt: for there is much leſs ſtrength in cold then in heat, and likewiſe in moiſture than in drineſs; and that is the cauſe why it will be longer before a Girl is formed in the womb than 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, Leaves, Flowers, Fruit, the Form, Colour, Smell, 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 we do always find 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 child that is born doth reſemble or is very like unto the Father or Mother, as his or her ſeed exceedeth in the mixture; yet for the moſt part it happeneth that the Children are more like the Father than the Mother, becauſe that in the time of copulation, the mind of the woman is more fixed on her husband, than the mind of the husband on, or towards his wife: for in the time of copulation or conception, the forms or the likeneſs of thoſe things that are conceived and kept in mind, are tranſported and impreſſed in the Child or iſſue: for ſo they affirm that there was a certain Queen of the *Æthiopians* who brought forth a white child, the reaſon was (as ſhe confeſſed) that at the time of copulation with her King, ſhe thought on a marvelous white thing;

Why men-children are ſooner formed in the womb than 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 be gotten.

thing, with a very ſtrong imagination. Therefore *Heſiod* adviſeth all married people not to give themſelves to carnal copulation when they return from burials, but when they come from Feaſts and Plays, leſt that their ſad, heavy, and penſive cogitations, ſhould be ſo transfuſed and engraften in the iſſues, that they ſhould contaminate or infect the pleaſant joyfulneſs of his life with ſad, penſive or paſſionate thoughts. Sometimes it happeneth, although very ſeldom, the child is neither like the Father nor the Mother, but in favour reſembleth his Grandfather, or any other of his Kindred; by reaſon that in the inward parts of the parents, the engrafted power and nature of the Grandfather lies hidden; which when it hath lurked there long, not working any effect, at length breaks forth by means of ſome hidden occaſion: wherein Nature reſembleth the Painter, making the lively pourtraiture of a thing, which as far as the ſubject matter will permit, doth form the iſſue like unto the Parents in every habit; ſo that often-times the diſeaſes of the Parents are transferred or participated unto the children, as it were by a certain hereditary title: for thoſe that are crook-backt, get crook-backt children; thoſe that are lame, lame; thoſe that are leprous, leprous; thoſe that have the ſtone, children having the ſtone; thoſe that have the ptiſick, children having the ptiſick; and thoſe that have the gout, children having the gout: for the ſeed follows the power, nature, temperature, and complexion of him that engendereth it. Therefore of thoſe that are in health and ſound, healthy 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 elſe the temperate and ſound womb as it were by the gentle and pleaſant breath thereof.

Why often-times the child reſembleth the Grandfather.

Why ſometimes thoſe that are diſeaſed do get ſound children.

CHAP. III.

What is the cauſe why Females of all brute Beaſts, being great with young, do neither deſire, nor admit the Males, until they have brought forth their Young.

Why the ſenſe of Venereous acts is given to brute beaſts

THe cauſe hereof is, for as much as they are moved by ſenſe onely, they apply themſelves unto the thing that is preſent, very little or nothing at all perceiving things that are paſt and to come. Therefore after they have conceived, they are unmindful of the pleaſure that is paſt, and do abhor copulation; for the ſenſe or feeling of luſt is given unto them by Nature, onely for the preſervation of their kind, and not for voluptuouſneſs, or delectation. But the Males raging, ſwelling, and as it were ſtimulated by the provocations of the heat or fervency of their luſt, do then run unto them, follow and deſire copulation, becauſe a certain ſtrong odor or ſmell cometh 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 ſenſe and feeling of venerous actions ſeemeth to be given by nature to Women, not onely for the propagation of iſſue and for the conſervation of mankind, but alſo to mitigate and aſſwage the miſeries of mans life, as it were by the enticements of that pleaſure: alſo the great ſtore of hot bloud that is about the heart, wherewith men abound, maketh greatly to this purpoſe, which by impulſion of imagination, which ruleth the humours, being driven by the proper paſſages down from the heart and entrails into the genitals, doth ſtir up in them a new luſt.

Why of brute beaſts the Males raging with luſt, follow after the Females.

Wherefore a woman when ſhe is with child, deſireth copulation.

The Males of brute Beaſts, being provoked or moved by the ſtimulation 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 kind, they preſently become gentle, and leave off ſuch fierceneſs.

CHAP. IV.

What things are to be obſerved, as neceſſary unto generation in the time of copulation.

How women may be moved to Venery and Conception.

WHen the Husband cometh into the Wifes Chamber, he muſt entertain her with all kind of dalliance, wanton behaviour, and allurements to Venery; but if he perceive her to be ſlow, and more cold, he muſt cheriſh, embrace, and tickle her, and ſhall not abruptly, the nerves being 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 ſhe may take fire, and be enflamed to venery; for ſo at length the womb ſhall ſtrive and wax fervent with a deſire of caſting forth its own ſeed, and receive the mans ſeed to be 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 yielding forth of their ſeed, it ſhall be neceſſary firſt to foment her ſecret parts with the decoction of hot herbs made with Muſcadine, or boiled in any other good Wine, and to put a little Muſk or Civet into the neck or mouth of the womb: and when ſhe ſhall perceive the efflux of her ſeed to approach, by reaſon of the tickling pleaſure, ſhe muſt advertiſe her husband thereof, that at the very inſtant time or moment, he may alſo yield forth his ſeed, that by the concourſe or meeting of the ſeeds, conception may be made, and ſo at length a child formed and born. And that it may have the better ſucceſs, the husband muſt not preſently ſeparate himſelf from his wifes embraces, leſt the air ſtrike into the open womb, and ſo corrupt the ſeeds before they are perfectly mixed together. When the man departs, 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 be ſhed or ſpilt: which is the cauſe why ſhe ought at that time not to talk, eſpecially chiding, nor to cough, nor ſneez, but give her ſelf to reſt and quietneſs, if it be poſſible.

The meeting of the ſeeds moſt neceſſary for generation.

CHAP.

CHAP. V.

By what signs it may be known, whether the Woman have conceived, or not.

IF the seed in the time of copulation, or presently after be not spilt, if in the meeting of the seeds the whole body do somewhat shake, that is to say, the womb drawing it self together for the compression and entertainment thereof, if a little feeling of pain doth run up and down the lower belly, and about the navel, if she be sleepy, if she loath the embracings of a man, and if her face be pale, it is a token that she hath conceived.

In sooth, after conception spots or freckles arise in their face, their eyes are depressed and sunk in, the white of their eyes waxeth pale, they wax giddy in the head, by reason that the vapours are raised up from the menstrual bloud that is stopped, sadness and heaviness grieve their minds, with loathing and waywardness, by reason that the spirits are covered with the smoaky darkness of the vapours: pains in teeth and gums, and swouning oftentimes cometh, the appetite is depraved or overthrown, with aptness to vomit, and longing, whereby it happeneth that they loath meats of goods juice, and long for and desire illaudable meats, and those that are contrary to nature, as coles, dirt, ashes, stinking salt-fish, such sowre, austere and tart fruits, pepper, vinegar, and such like acrid things, and other, altogether contrary to nature and use, by reason of the condition of the suppressed humour abounding and falling into the orifice of the stomach. This appetite so depraved or overthrown, endureth in some until the time of child-birth; in others it cometh in the third moneth after their conception, when hairs do grow on the child: and lastly, it leaveth them a little before the fourth moneth, because that the child, being now greater and stronger, consumes a great part of the excremental and superfluous humour. The suppressed or stopped terms in women that are great with child, are divided into three parts; the more pure portion maketh the nutriment for the child, 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 with child, whose urin is more sharp, fervent, and somewhat bloudy, the bladder not onely waxing warm by the compression of the womb; fervent, by reason of the bloud contained in it, but also the thinner portion of the same bloud being expressed, and sweating out into the bladder. A swelling and hardness of the dugs, and veins that are under the dugs in the breasts and about them, and milk coming out when they are pressed, with a certain stirring motion in the belly, are certain infallible signs of greatness with child. Neither in this greatness of child-bearing, the veins of the dugs onely, but of all the whole body, 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 cometh sluggishness of the whole body, heaviness and impotency, or difficulty 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 she goeth to sleep, some Mead or honied water to drink; and if she have a griping in her guts or belly, she hath conceived; if not, she hath not conceived.

Spots or specks in the faces of those that are with child.

Why many women being great with child refuse laudable meats, and desire those that are illaudable and contrary to Nature.

The suppressed Terms divided into three parts.

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 capacity of the womb, then the orifice thereof doth draw it self close together, lest the seeds should fall out. There the Females seed goeth and turneth into nutriment, and the increase of the Males seed; because all things are nourished, and do increase by those things that are most familiar, and like unto them. But the similitude and familiarity of seed with seed is far greater than with bloud; so that when they are perfectly mixed and coagulated together, and so wax warm by the straight and narrow enclosure of the womb, a certain thin skin doth grow about it, like unto that that will be over unskimmed Milk.

Why the female seed is nutriment for the male seed.

Moreover, this concretion or congealing of the seed, is like unto an Egg laid before the time that it should: that is to say, whose membrane or tunicle that it compasseth it about, hath not as yet increased or grown into a shelly hardness about it; in folding-wise are seen many small threds dividing themselves, over-spread with a certain clammy, whitish or red substance, as it were with black bloud. In the midst under it appeareth the navel, from whence that small skin is produced. But a man may understand many things that may appertain unto the conception of mankind by the observation of twenty Eggs, setting them to be hatched under an Hen, and taking one every day and breaking it, and diligently considering it; for in so doing, on the twentieth day you shall find 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 human conception.

This little skin is perfectly made within six days, according to the judgment of *Hippocrates*, as profitable and necessary 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 Latins *Acetabula*, for they are as it were hollowed eminences, like unto those which may be seen in the feet or snout of a Cuttle-fish many 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 many brute beasts. Therefore by these the secondine cleaveth on every side unto the womb, for the conservation, nutrition, and increase of the conceived seed.

Lib. de nat. puer.

What the *Cotyledones* are.

CHAP.

CHAP. VII.

Of the generation of the Navel.

AFter the Woman hath conceived, to every one of the aforesaid eminences groweth presently another vessel, that is to say, a Vein to the Vein, and an Artery to the Artery: these soft and yet thin vessels are framed with a little thin membrane, which being 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 Artery of the Navel. These new small vessels of the Infant, with their orifices, do answer directly one to one, to the *Cotyledones* or eminences of the womb; they are very small and little, as it were the hairy 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, because they do make the navel, and do enter into the childs body by the hole of the navel. Here *Galen* doth admire the singular providence of God and Nature; because 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 artery, nor the artery to the vein; but every vessel joineth it self to the vessel of its own kind. But the Umbilical vein, or Navel vein, entering into the body of the child, doth join it self presently to the hollow part of the liver; but the artery is divided into two, which join themselves to the two Iliack arteries along the sides of the bladder, and are presently covered with the *Peritonæum*; and by the benefit thereof annexed unto the parts which it goes unto. Those small veins and arteries are as it were the roots of the child; but the vein and artery of the Navel are as it were the body of the Tree, to bring down the nutriment to nourish the child. For first we live in the womb the life of Plant, and then next the life of a Sensitive Creature: and as the first tunicle of the child is called *Chorion* or *Allantoides*; so the other is called *Amnios* or *Agnina*, which doth compass the seed or child about on every side. These membranes are most thin, yea for their thinness like unto the Spiders web, woven one upon another; and also connexed in many places by the extremities of certain small and hairy substances, which at length by the adjunction of their like do get strength; whereby you may understand what is the cause 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 hairy substances, that between them nothing, neither the urin, nor the sweat can come, as you may plainly and evidently perceive in the dissection of a womans body that is great with child, not depending on any other mans opinion, be it never so old or inveterate: yet the strength of those membranes is not so great, but that they may be soon broken in the birth, by the kicking of the child.

The Vein never joineth it self with the artery.

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 Secondines.

CHAP. VIII.

Of the Umbilical Vessels, or the Vessels belonging to the Navel.

MAny of the ancient Writers have written that there are five Vessels found in the Navel. But yet in many, nay all the bodies I fought in for them, I could never find but three; that is to say, one Vein, which is very large, so that in the passage thereof it will receive the tag of a point, and two Arteries, but not so large, but much narrower; because the child wanteth or standeth in need of much more bloud for his conformation, and the nutriment or increase of his parts, than of vital spirit.

An old opinion confuted.

These Vessels making the body of the Navel, which, as it is thought, is formed within nine or ten days by their doubling and folding, make knots like unto the knots of a Franciscan Friers girdle, that staying the running bloud in those their knotty windings, they might more perfectly concoct the same: as may be seen in the ejaculatory spermatick vessels, for which use also the length of the Navel is half an ell; so that in many Infants that are somewhat grown, it is found three or four times doubled about their neck or thigh.

To what use the knots of the childs Navel in the womb serve.

As long as the child is in his Mothers womb, he taketh his nutriment onely by the Navel, and not by his Mouth; neither doth he enjoy the use of eyes, ears, nostrils, or fundament, neither needeth he the functions of the heart. For the spirituous bloud 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 Body, for by the motion of these onely the Infant doth breath. Therefore it is not to be supposed that the air is carried or drawn in by the lungs unto the heart, in the body of the child, but contrariwise from the heart to the lungs. For neither the heart doth perform the generation or working of bloud, 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 be called a Child, but rather an Embryon, or an imperfect substance.

The child in the womb taketh his nutriment by his Navel, not by his Mouth.

How the child breatheth.

CHAP.

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 entrails.

IN the six first days of conception the new vessels are thought to be made and brought forth of the eminences or *cotyledons* of the mothers vessels, and dispersed into all the whole seed, as they were *fibres*, or hairy 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, being a passage not onely necessary for the nutriment and conformation of the parts, but also into the veins diversly woven and dispersed into the skin *Chorion*. For thereby it cometh to pass, that the seed it self boileth, and as it were fermenteth or swelleth, not only through occasion of the place but also of the bloud 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 principal entrails, 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 bubble arise, it is called an embryon, or the rude form of a body until the perfect conformation of all the members: on the fourth day after that the vein of the navel is formed, it sucketh grosser bloud, that is, of a more full nutriment out of the *Cotyledons*. And this bloud, because it is more gross, easily congeals and curdles 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*, because it is but only a certain congealing or concretion of bloud 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 all the substance thereof; and then it is divided into two branches, whereof the one groweth upwards, the other downwards unto all the particular parts of the body.

The three bladders.

When the seed is called an embryon.

Why the liver is called Parenchyma.

In the mean season the arteries of the navel suck spirituous bloud out of the eminences or *Cotyledons* of the mothers arteries, whereof, that is to say, of the more fervent and spirituous bloud the heart is formed in the second bladder or bubble, being endued with a more fleshy, sound, and thick substance, as it behoveth that vessel to be, 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 necessary nutriment for the heart: in the left is formed the stamp or root of an artery, 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 body 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, yielding matter for the conformation of the brain, and all the head. For a greater quantity of seed ought to go unto the conformation of the head and brain; because these parts are not sanguine or bloody, as the heart and liver; but in a manner without bloud, bony, marrow, cartilaginous, nervous, and membranous, whose parts, as the veins, arteries, nerves, ligaments, panicles, and skin, are called *spermatick* parts; because they obtain their first conformation almost of seed only: although that afterwards they are nourished with blood, as the other fleshy and musculous parts are. But yet the bloud, when it cometh unto those parts, degenerateth, and turneth into a thing somewhat spermatick, by vertue of the assimulative faculty of those parts. All the other parts of the head form and fashion themselves 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 mind and reason, is situated in the highest place; that from thence, as it were from a lofty 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 body. Nature hath framed these three principal entrails, as props and sustentations for the weight of all the rest of the body: for which matter also she hath framed the bones.

Why the head is placed on the top of the body.

The first bones that appear to be formed, or are supposed to be 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 be made mothers or bear children.

When all these are finished, nature, that she might polish her excellent work in all sorts, hath covered all the body and every member thereof with skin. Into this excellent work or *Micro-cosmos* so perfect, God, the author of nature and all things, infuseth or ingrafteth a soul or life: which S. *Augustine* proveth by this sentence of *Moses*: *If any man smite a woman with child, so* *Exod. 20. 21. 22.*

that thereby she be 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 full proportion and conformation of his body and members, let him recompence it with money. Therefore it is not to be thought that the life is derived, propagated or taken from *Adam* or our parents; and as it were an hereditary thing distributed unto all mankind by their parents; but we must believe it to be immediately created of God, even at the very instant time when the child is absolutely perfected in the lineaments of his body, and so given unto it by him.

The *Mola* in the womb liveth not as the child.

So therefore the rude lumps of flesh called *molæ* that engender in womens wombs, and monsters of the like breeding and confused bigness, although by reason of a certain quaking and shivering motion, they seem to have life, yet they cannot be supposed to be endued with a life or a reasonable soul: but they have their motion, nutriment and increase wholly of the natural and infixed faculty of the womb, and of the generative or procreative spirit that is ingrafted naturally in the seed.

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 smalness of the motion. But now let us speak briefly of the life or soul, wherein consisteth the principal original of every function in the body, and likewise of generation.

CHAP. XI.

Of the life or soul.

The life goeth not into the mass of seed that doth engender the child, before the body of the child and each part thereof hath his perfect proportion and form. Why the life or soul doth not presently execute all his offices.

THE soul entreth into the body 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 ingrafted in them, is about the fourtieth day, and in females about the fourty fifth day; in some sooner, and in some later, by reason of the efficacy of the matter working, and pliantness or obedience of the matter whereon it worketh. Neither doth the life or soul being thus inspired into the body presently execute or perform all his functions, because the instruments that are placed about it cannot obtain a firm and hard consistence necessary for the lively, but especially for the more divine ministeries of the life or soul, but in a long process of age and time.

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 *Triboulet* and *Tonin* that lived in later years; or also by some casualty, as by the violent handling of the midwife, who by compression, by reason that the scull is tender and soft, hath caused the capacity of the ventricles that be under the brain to be too narrow for them: or by a fall, stroak, disorder in diet, as by drunkenness, or a feaver, which inferreth a lethargy, excessive sleepiness, or phrensie.

1 *Cor.* 6. 12.

Presently after the soul is entred into the body, God endueth it with divers and sundry gifts: hereof it cometh that some are endued with wisdom by the spirit; others with knowledge 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 bounty 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 me thus? hath not the Potter power to make of the same lump of clay one vessel to honor and another to dishonour?* It is not my purpose, neither belongeth it unto me nor any other humane creature to search out the reason of those things, but only to admire them with all humility: But yet I dare affirm this one thing, that a noble and excellent soul neglecteth elementary and transitory things, and is ravished and moved with the contemplation of celestial, which it cannot freely enjoy before it be separated from this earthly inclosure or prison of the body, and be restored unto its original.

What the soul or life is.

Therefore the soul is the inward *Entelechia* or perfection, or the primitive cause of all motions and functions both natural and animal, and the true form of man. The Ancients have endeavoured to express the obscure sense thereof by many descriptions. For they have called it a celestial spirit, and a superior, incorporeal, invisible, and immortal essence, which is to be comprehended of it self alone, that is, of the mind or understanding. Others have not doubted but that we have our souls inspired by the universal divine mind, which as they are alive, so they do bestow life on the bodies unto whom they are annexed or united. And although this life be dispersed into all the whole body, and into every portion of the same, yet is it void of all corporal weight or mixtion, and it is wholly and alone in every several part, being simple and invisible, without all composition or mixture, yet endued with many virtues and faculties, which it doth utter in divers parts of the body: For it feeleth, imagineth, judgeth, remembreth, understandeth, and ruleth all our desires, pleasures, and animal motions; it seeth, heareth, smelleth, tasteth, toucheth; and it hath divers names of these so many and so great functions, which it performeth in divers parts of the body. It is called the soul of life; because it maketh the body live, which of it self is dead. It is called the *spirit* or *breath*; because it inspireth our bodies. It is called *reason*; because it discerneth truth from falsehood, as it were by a certain divine rule. It is termed the mind; because it is mindful of things past, in recalling and remembring them: And it is called the *vigor* or *courage*; because it giveth vigor and courage to the sluggish weight, or mass of the body. And lastly, it is called the sense and *understanding*: because it comprehendeth things that are sensible and intelligible. Because it is incorporeal, it cannot occupy a place by corporeal extention; although notwithstanding

The life is in all the whole body and in every portion thereof.

The life or soul is simple and invisible.

Divers names and the reason of divers names that are given to humane forms.

withſtanding it filleth the whole body. It is ſimple, becauſe it is but one in eſſence, nor increaſed, nor diminiſhed: for it is no leſs in a Dwarf than in a Giant; and it is like perfect and great in an infant as in a man, according to its own nature.

Three kinds of living bodies.

But there are three kinds of bodies informed by a ſoul whereby they live: the firſt being 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 vertues of the vegetative; ſo the humane intellective comprehendeth the vertues of all the inferior, not ſeparated by any diviſion, but by being indiviſibly united with reaſon and underſtanding, into one humane form and ſoul whereon they depend. But becauſe we have ſaid a little before, that divers functions of the life are reſident, and appear in divers parts of the body, here in this place, omitting all others, we will proſecute thoſe only which are accounted the principal.

The ſuperiour ſoul containeth in it ſelf all the powers of the inferiour.

The principal functions of the humane ſoul, according to the opinion of many, are four in number, proceeding from ſo many faculties, and conſequently from one ſoul; they are theſe: The Common Senſe, Imagination, Reaſoning, and Memory. And they think that the common or interiour ſenſe doth receive the forms and images of ſenſible things, bein carried by the ſpirit through the paſſage of the nerves, as an inſtrument of the external ſenſes, as it were a meſſenger to go between them; and it ſerves not only to receive them, but alſo to know, perceive, and diſcern them. For the eye, wherein the external ſenſe of ſeeing conſiſteth, doth not know white or black. Therefore it cannot diſcern the differences of colours, as neither the tongue taſtes, nor the noſe ſavours nor the ears ſound, nor laſtly, the hands their touching quality: yea, the eye doth not of it ſelf perceive that it ſeeth, 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 ſenſe; for this ſenſe knoweth that the eye hath ſeen ſomething, either white, black, red, a man, horſe, ſheep, or ſome ſuch like material thing; yea, even when the ſight is gone and paſt; and ſo likewiſe the noſe to have ſmelled this or that ſavour, 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, be they never ſo diverſe. For all the external ſenſes, and all the functions thereof do end, and are referred to the Common ſenſe, as it were the lines of a circle from the circumference into the center, as it is expreſſed in this figure.

What the common ſenſe is. The function of the common ſenſe is double.

For which cauſe it is called the common or principal ſenſe; for that therein the primitive power of feeling or perceiving is ſituated, for it uſeth the miniſtery or ſervice of the external ſenſes, to know many and diverſe things, whoſe differences it doth diſcern and judge; but ſimple things, that are of themſelves, and without any compoſition and connexion, which may conſtitute any thing true or falſe, or any argumentation, belongeth only to the mind, underſtanding, or reaſon. For this was the counſel of nature, that the external ſenſes ſhould receive the forms of things ſuperficially, lightly, and gently only; like as a glaſs, not to any other end, but that they ſhould preſently ſend them unto the Common ſenſe, as it were unto their center and prince, which he (that is to ſay, the Common ſenſe) delivereth to be collected unto the underſtanding or reaſoning faculty of the ſoul, which *Avicen* and *Averrois* have ſuppoſed to be ſituated in the former part of the brain.

What cauſe the internal ſenſe is called the common ſenſe.

The common ſenſe underſtandeth or knoweth thoſe things that are ſimple only.

Next unto the common ſenſe followeth the phantaſie or imagination, ſo called becauſe of it ariſe the forms and *Ideas* that are conceived in the mind, called of the Greeks *Phantaſmata*. This doth never reſt but in thoſe that ſleep: neither always in them, for oft-times in them it cauſeth dreams, and cauſeth them to ſuppoſe they ſee and perceive 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 mind is ſo great in us, that it often bringeth the whole body in ſubjection unto it.

What imagination is.

For it is recorded in hiſtory, that *Alexander* the Great ſitting at Table, and hearing *Timotheus* the Muſician ſing a Martial ſonnet unto his Cythern, that he preſently leaped from the Table, and called for arms; but when again the Muſician mollified his tune, he returned to the Table and ſate down as before. The power of imagination cauſed by muſical harmony was ſo great, that it ſubjected to it the courage of the worlds conqueror, by whoſe various motion, it would now as it were cauſe him to run headlong to arms, and then pacifie and quiet him, and ſo cauſe him to return to his chair and banquetting again. And there was one whoſoever it was, who ſome few years agon ſeeing the Turk dance on a rope on high with both his feet faſtned in a baſin, turned his eyes from ſo dangerous a ſight or ſpectacle, although came of purpoſe to ſee it, and ſtricken with ſuch fear that his body ſhook and heart quaked, for fear leſt that by ſudden falling down headlong he ſhould break his neck. Many looking down from an high and lofty place, are ſo ſtricken with fear, that ſuddenly they fall down headlong, being ſo overcome 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 lovingly with us, who unto this power of imagination, hath joined another, that is, the faculty or power of reaſon and underſtanding; which diſcerning falſe dangers and perils from true, doth ſuſtain and hold up a man that he may not be overthrown by them.

What Reason is.

After this, appeareth and approacheth to perform his function, the faculty of Reason, being 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 or things into one heap, that by dividing, collecting, and reasoning it might discern and try truth from fallhood.

The functions of Reason.

This faculty of Understanding or Reason is subject to no faculty or instrument of the body, but is free, and penetrateth into every secret, intricate and hidden thing with an incredible celerity: by which a man seeth what will follow, perceiveth the originals and causes of things, is not ignorant of the proceedings of things; he compareth things that are past with those that are present and to come, decreeing what to follow, and what to avoid. This bridleth and with-holdeth the furious motions of the mind, bridleth the over-hasty motions of the tongue, and admonisheth the speaker that before the words pass out of his mouth, he ought with diligence and discretion to ponder and consider the thing whereof he is about to speak.

What memory is.

After Reason and Judgment followeth Memory, 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 body of the brain, without any impression of the matter; that when occasion serveth, we may bring them forth there-hence as out of a treasury or store-house. For otherwise to what purpose were it to read, hear, and note so many things, unless we were able to keep and retain them in mind by the care and custody of the Memory or Brain? Therefore assuredly God hath given us this only remedy and preservative against the oblivion and ignorance of things, which although of it self and of its own nature it be of greater efficacy, yet by dayly and often meditation it is trimmed and made more exquisite and perfect. And hence it was that the Antients termed wisdom the daughter of memory and experience. Many have supposed that the mansion or seat of the Memory, is in the hinder part, or in the ventricle of the *Cerebellum*, by reason that it is apt to receive the forms of things, because of the engrafted driness and hardness thereof.

Wisdom the daughter of memory and experience.

CHAP. XII.

Of the natural excrements in general, and especially of those that the child or infant being in the womb excludeth.

What an excrement is.

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 and nourishing juice. There are many kinds of those excrements.

The excrement of the first concoction.

The first is of the first concoction, which is performed in the stomach, which being driven down into the intestines or guts, is voided by the fundament.

The excrement of the second concoction is triple.

The second cometh from the Liver, and it usually is three-fold, or of three kinds; one 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 faculty 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 body, and into every capillar vein for to nourish the whole body; 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 being drawn by the milt, the purer and thinner part thereof goeth into 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 stomach, to stimulate and provoke the appetite.

The excrement of the third concoction is triple.

The last cometh of the last concoction which is dissolved in the habit of the body, 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 every part: as it happeneth in the brain before all other parts; for it doth unload it self of this kind of excrements by the passages of the nose, mouth, ears, eyes, palat-bone and sutures of the skull.

Therefore if any of these excrements be stayed altogether, or any longer than it is meet they should, the default is to be amended by diet and medicine. Furthermore there are other sorts of excrements not natural, of which we have entreated at large in our book of the Pestilence.

The use of the navel-string.

When the infant is in the mothers womb, until he is fully and absolutely formed in all the lineaments of his body, he sends forth his urine by the passages of the navel or *urachus*. But a little before the time of child-birth, the *urachus* is closed, and then the man-child voideth his urine by the conduit of the yard, and the woman-child 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 menstrual matter, for the more easie bearing up of the floating or swimming child. But in the time of child-birth, when the infant by kicking breaketh the membranes, those humors run out, which when the midwives perceive, they take it as a certain sign that the child is at hand. For if the infant come forth together with those waters, the birth is like to be more easie, and with better success; for the neck of the womb and all the genitals are so by their moisture relaxed and made slippery, that by the endeavour and stirring of the infant, the birth will be more easie, and with better success: contrariwise, if the infant be not excluded before all these humors be wholly flown out and gone, but remaineth as it were in a dry place, presently through driness the neck of the womb and all the genitals will be contracted and drawn together, so that the birth of the child will be very difficult and hard, unless the neck of the womb, to amend that default, be anointed with oyl or some other relaxing liquor.

The signs of speedy and easie deliverance.

Moreover

Moreover, when the child is in the womb, he voideth no excrements by the fundament, unleſs it be when at the time of the birth, the proper membranes and receptacles are burſt by the ſtriving of the infant; for he 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 any other concoction; wherefore nothing can go down from it into the guts. Neither have I ſeldom ſeen infants born without any 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 be engendred, when the child being in the womb, is nouriſhed with the more laudable portion of the menſtrual bloud; therefore the iſſue or child is wont to yield or avoid two kinds or ſorts of excrements, ſo long as he is in the womb, that is to ſay, ſweat and urine, in both which he ſwims; but they are ſeparated by themſelves, by a certain tunicle called *Allantoides*, as it may be ſeen in kids, dogs, ſheep, and other brute beaſts; for as much as in mankind the tunicle *Chorion* and *Allantoides* or *Farcominalis*, be all one membrane. If the woman be great of a man-child, ſhe is more merry, ſtrong and better coloured, all the time of her child-bearing; but if a woman-child, ſhe is ill coloured, becauſe that women are not ſo hot as men.

Children born without a paſſage in their fundament.

Aph. 24. *ſect.* 5.

The males begin to ſtir within three months and a half, but females after: if a woman conceive a male-child, ſhe hath all her right parts ſtronger to every work: wherefore they do begin to ſet forwards their right foot firſt in going, and when they ariſe they lean on the right arm, the right dug will ſooner ſwell and wax hard: the male-child ſtir more in the right ſide than in the left, and the female-children rather in the left than in the right ſide.

Aph. 47. *ſect.* 5.

CHAP. XIII.

With what travail the Child is brought into the world, and of the cauſe of this labour and travail.

When the natural prefixed and preſcribed time of child-birth is come, the child being then grown greater, requires a greater quantity of food: which when he cannot receive in ſufficient meaſure by his navel, with great labour and ſtriving he endeavoreth to get forth: therefore then he is moved with a ſtronger violence, and doth break the membranes wherein he is contained. Then the womb, becauſe it is no able to endure ſuch violent motions, nor ſuſtain or hold up the child any longer, by reaſon that the conceptacles of the membranes are broken aſunder, is relaxed, and then the child purſuing the air which he feeleth to enter in at the mouth of the womb, which then is very wide and gaping, is carried with his head downwards, and ſo cometh into the world with great pain both unto it ſelf, and alſo unto his Mother, by reaſon of the tenderneſs of his body, and alſo by reaſon of the nervous neck of his mothers 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 only twins that cleave faſt together, but alſo one child alone, come forth forth at ſo narrow a paſſage as the neck of the womb is; Not only reaſon, but alſo experience confirmeth it; for I opened the bodies of women preſently after they have died in travail in child-birth, in whom I have found the bones of *Ilium* to be drawn the bredth of ones finger from *Os ſacrum*: and moreover, in many unto whom I have been called, being in great extremity of difficult and hard travail, I have not only heard, but alſo felt the bones to crackle and make a noiſe, when I laid my hand upon the coccyx or rump, by the violence of the diſtention. Alſo honeſt matrons have declared unto me that they themſelves, a few days before the birth, have felt and heard the noiſe of thoſe bones ſeparating themſelves one from another with great pain. Alſo a long time after the birth many 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 continuity of the bones of *Ilium*, they are conſtrained to halt all the days of their life after. But the bones of the ſhare called *Oſſa pubis*, I have never ſeen to be ſeparated, as many do alſo affirm. It is reported that in *Italy* the coccyx or rump in all Maidens is broken that when they come to be married they may bear children with leſſer travail in child-birth; but this is a forged tale, for that bone being broken, is naturally and of its own accord repaired, and joined together again with a *Callus*, whereby the birth of the child will be more difficult and hard.

Why the infant is born ſometimes with his head forwards.

In the time of child-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 diverſe both in living and dead women: in the dead by opening their bodies preſently after they were dead; and in the living by helping them by the induſtry of my hand, when they have been in danger of periſhing by travail of child-birth: for by putting my hand into the womb, I have felt the infant coming forth, ſometimes with his feet forward, and ſometime with his hands and feet turned backwards, and ſometimes forwards, as the figure following plainly deſcribeth.

The ſituation of the infant in the womb is diverſe.

I have often found them coming forth with their knees forwards, and sometimes with one of the feet, and sometimes with their belly forwards, their hands and feet being lifted upwards, as the former figure sheweth at large.

Sometimes I have found the Infant coming with his feet downwards striding awide, and sometimes headlong, stretching one of his arms downward out at length and that was an Hermaphrodite, as this figure 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 child I have sometimes found children no bigger than if they had been but four moneths 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 child being yet alive in the body of his mother (whom I opened so soon as she was dead) lying all along stretched out, with his face upwards, and the palms of his hands joined together, as if he was at prayer.

CHAP. XV.

Which is the legitimate and natural, and which the illegitimate or unnatural time of child-birth.

Mankind hath no certain time of bringing forth young.

TO all living creatures, except Man, the time of conception and bringing forth their young is certain and definite; but the issue of Man cometh into the world, sometimes in the seventh, sometimes in the eighth, and sometimes which is most frequent, in the ninth month; sometimes in the tenth month; yea sometimes in the beginning of the eleventh month. *Massurius* reports that *Lucius Papyrius* the Prætor, the second heir commencing a suit, gave the possession of the goods away from him, seeing the Mother of the Child affirmed that she went thirteen months therewith, being there is no certain definite time of Child-birth. The child that is born in the sixth month, cannot be long lived, because at that time all his body or members are not perfectly finished, or absolutely formed. In the seventh month it is proved by reason and experience that the infant may be long lived. But in the eighth month it is seldom or never long lived: the reason thereof is, as the Astronomers suppose, because at that time Saturn ruleth, whose coldness and driness is contrary to the original of life: but yet the physical reason is more true; for the Physicians say that the child in the womb doth oft-times in the seventh month strive to be set at liberty from the inclosure of the womb, and therefore it contendeth and laboureth greatly, and so with labouring and striving it becometh 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 some by such labouring and striving hurt themselves, and so die. Yet some strong and lusty women are thought to bring forth their children, being lively and strong, on the eighth month, as *Aristotle* testifieth of the *Egyptians*, the Poets of the inhabitants of the Isle of *Naxus*, and many of the *Spaniards*. Furthermore I cannot sufficiently marvel, that the womb, which all the time of child-bearing is so closed together, that one can scarce put

Why the child is scarce alive in the eighth month.

Lib. 4. de hist. anim. cap. 7.

put a probe into it, unleſs it be by ſuperfœtation, or when it is open for a ſhort time to purge it ſelf, that preſently before the time of child-birth, it ſhould gape and wax ſo wide, that the infant may paſs through it, and preſently after it cloſe up again as if it had never been opened. But becauſe that the travail of the firſt time of child-birth is wont to be very difficult and grievous, I think it not unmeet that all women, a little before the time of their firſt travail, anoint and relax their privy parts with the unguent here deſcribed. *℞. ſper. ceti,* ℥ij. *ol. amygd. dul.* ℥iv. *ceræ alb. & medul. cervin.* ℥iij. *axung. anſ. & gallin. an.* ℥j. *tereb. venet.* ℥ij. make thereof an ointment to anoint the thighs, ſhare, privy parts and genitals. Furthermore, it ſhall not be unprofitable, to make a truſs or girdle of moſt thin and gentle dog-skin, which being alſo anointed with the ſame unguent, may ſerve very neceſſarily for the better carrying of the infant in the womb. Alſo baths that are made of the decoction of mollifying herbs, are alſo very profitable to relax the privy parts a little before the time of the birth. That is ſuppoſed to be a natural and eaſie birth, when the infant cometh forth with his head forwards, preſently following the flux of water; and that is more difficult, when the infant cometh with his feet forwards: all the other ways are moſt difficult. Therefore Midwives are to be admoniſhed that as often as they perceive the child to be coming forth none of thoſe ways, but either with his belly or his back forwards, as it were doubled; or elſe 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 be not ſufficient, let them crave the aſſiſtance and help of ſome expert Chirurgion.

The natural and eaſie child-birth.

CHAP. XVI.

Signs of the birth at hand.

THere will be 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 *Coccyæ* are thruſt outward, the genitals ſwell with pain, and a certain Fever-like ſhaking invades the body, the face waxeth red by reaſon of the endeavour of nature, armed unto the expulſion of the infant. And when theſe ſigns appear, let all things be prepared ready to the child-birth. Therefore firſt of all let the woman that is in travail be placed in her bed conveniently, neither with her face upwards, nor ſitting, but with her back upwards and ſomewhat high, that ſhe may breath at more liberty, and have the more power or ſtrength to labour. Therefore ſhe ought to have her legs wide one from another, and crooked, or her heels ſomewhat bowed up towards her buttocks, ſo that ſhe may lean on a ſtaff that muſt be placed overthwart the bed. There are ſome that do travail in a ſtool or a chair made for the ſame purpoſe: others ſtanding on their feet, and leaning on the poſt or pillar of the bed. But you muſt take diligent heed that you do not exhort or perſwade the woman in travail to ſtrive or labour to expel the birth before the fore-named ſigns thereof do manifeſtly ſhew that it is at hand. For by ſuch labour or pains ſhe might be wearied or ſo weakned, that when ſhe ſhould ſtrive or labour, ſhe ſhall have no power or ſtrength ſo to do. If all theſe things do fall out well in the child-birth, the buſineſs is to be committed to nature, and to the Midwife. And the woman with child muſt only be admoniſhed that when ſhe feeleth very ſtrong pain, that ſhe preſently therewith ſtrive with moſt ſtrong expreſſion, ſhutting her mouth and noſe if ſhe pleaſe, and at the ſame time let the Midwife with her hands force the infant from above downwards. But if the birth be more difficult and painful, by reaſon that the waters wherein the infant lay are flown out long before, and the womb be dry, this ointment following is to be prepared. *℞. butyri recentis ſine ſale in aqua artemiſiæ loti,* ℥ij. *mucaginis ficuum, ſemin. lini & althææ, cum aqua ſalinæ extractæ, an.* ℥ß. *olei liliorum,* ℥j. make thereof an ointment, wherewith let the Midwife often anoint the ſecret parts. Alſo this powder following may be prepared. *℞. Cinnamom. cort. caſſiæ ſiſtul. diſtannii an.* ʒjß. *ſuccib. albi ad pondus omnium:* make thereof a moſt ſubtil and fine powder. Let the woman that is in extremity by reaſon of difficult and painful travail in child-birth, take half an ounce thereof at a time, with a decoction of line-ſeed, or in white wine, for it will cauſe more ſpeedy and eaſie deliverance of the child.

How the woman that travaileth in child-birth muſt be placed in her bed.

An unction to ſupply the defect of the waters that are flowed out too long before the birth.

A powder to cauſe ſpeedy deliverance in child-birth.

Moreover let the Midwife anoint her hands with this ointment following, as often as ſhe putteth them into the neck of the womb, and therewith alſo anoint the parts about it. *℞. olei ex ſeminibus lini,* ℥j ß. *olei de caſtoreo,* ℥j. *gallinæ moſchatæ,* ʒiij. *ladani* ʒj. make thereof a liniment. Moreover, you may provoke ſneezing, by putting a little pepper or white hellebore in powder into the noſtrils. Line-ſeed beaten, and given in potion, with the water of Mugwort and Savine, is ſuppoſed to cauſe ſpeedy deliverance. Alſo the medicine following is commended for the ſame purpoſe. *℞. cortic caſſiæ ſiſtul. conquaſſatæ* ℥ij. *cicer. rub.* m ß. *balliant cum vino albo & aqua ſufficienti, ſub finem addendo ſabinæ* ʒij. *in colaturæ pro doſi adde cinam.* ʒß. *croci gr.* vj. make thereof a potion, which being taken, let ſneezing be provoked, as it is above-ſaid, and let her ſhut or cloſe her mouth and noſtrils.

Aph. 35. & 43. *ſect.* 5. *&*

A potion cauſing ſpeedy deliverance.

Many times it happeneth that the infant cometh 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 happy ſtriving of the mother, he cometh forth together with the water wherein it lieth in the womb, and then the Midwives propheſie or fore-tell that the child ſhall be happy, becauſe he is born as it were with a hood on his head. But I ſuppoſe that it doth betoken health of body both to the infant and alſo to his mother; for it is a token of eaſie deliverance. For when the birth is difficult and painful, the child never bringeth that membrane out with him, but it remaineth behind in the paſſages of the genitals or ſecret parts, becauſe they are narrow. For even ſo the Snake or Adder when ſhe ſhould caſt her skin thereby to renew her age, creepeth through ſome narrow or ſtrait paſſage. Preſently after birth, the woman ſo delivered muſt take two or three ſpoon-

What a woman in travail muſt take preſently after her deliverance.

fuls

fulls of the oil of ſweet almonds extracted without fire, and tempered with ſugar. Some will rather uſe the yolks of eggs with ſugar, ſome the wine called Hypocras, others cullifes or gelly: but always divers things are to be uſed, according as the Patient or the woman in child-bed ſhall be grieved, and as the Phyſician ſhall give counſel, both to eaſe and aſſwage the furious torments and pain of the throws, to recover her ſtrength and nouriſh her.

The cauſe of the after-throws.

Throws come preſently after the birth of the child, becauſe that then the veins (nature being 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 becauſe they are groſs, ſlimy and dreggiſh, cannot come forth without great pain both to the veins from whence they come, and alſo unto the womb whereunto they go: alſo then by the converſion of that portion thereof that remaineth into wind, and by the undiſcreet admiſſion of the air in the time of the child-birth, the womb and all the ſecret parts will ſwell, unleſs it be prevented with ſome digeſting, repelling or mollifying oil, or by artificial rowling of the parts about the belly.

CHAP. XVII.

What is to be done preſently after the child is born.

Why the ſecundine or after-birth muſt be taken away preſently after the birth of the child.

PReſently after the child is born, the Midwife muſt draw away the ſecundine or after-birth, as gently as ſhe can: but if ſhe cannot, let her put her hands into the womb, and ſo draw it out, ſeparating it from the other parts; for otherwiſe if it ſhould continue longer, it would be more difficult to be gotten out, becauſe that preſently after the birth the orifice of the womb is drawn together and cloſed, and then all the ſecundine muſt be taken from the child. Therefore the navel-ſtring muſt be tied with a double thred an inch from the belly. Let not the knot be too hard, leſt that part of the navel-ſtring which is without the knot, ſhould fall away ſooner than it ought, neither too ſlack or looſe, 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 the childs body. When the knot is ſo made, the navel-ſtring muſt be cut in ſunder the bredth of two fingers beneath it with a ſharp knife. Upon the ſection you muſt apply a double linnen cloth dipped in oyl of Roſes, or of ſweet Almonds, to mitigate the pain; for ſo within a few days after, that which is beneath the knot will fall away being deſtitute of life and nouriſhment, by reaſon that the vein and artery are tied ſo cloſe, that no life nor nouriſhment can come unto it: commonly all Midwives do let it lie unto the bare belly of the infant, whereof cometh grievous pain and griping, by reaſon of the coldneſs thereof which dieth by little and little as deſtitute of vital heat. But it were far better to rowl it in ſoft cotten or lint, until it be mortified, and ſo fall away.

The binding of the childs 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 avoiding of the ſecundine. When all theſe things are done, the infant muſt be wiped, cleanſed and rubbed from all filth and excrement with oil of Roſes or Myrtles. For thereby the pores of the skin will be better ſhut, and the habit of the body the more ſtrengthened.

There be ſome that waſh infants at that time in warm water and red wine, and afterwards anoint them with the fore-named oils. Others waſh them not in wine alone, but boil therein red Roſes and the leaves of Myrtles, adding thereto a little ſalt; and then uſing this lotion for the ſpace of five or ſix days, they not only waſh away the filth, but alſo reſolve and digeſt, if there be any hard or contuſed place in the infants tender body, by reaſon of the hard travail and labour in child-birth.

The defaults that are commonly in children newly born.

Their toes and fingers muſt be handled, drawn aſunder and bowed, and the joints of the arms and legs muſt be extended and bowed for many days and often; that thereby that portion of the excremental humor that remaineth in the joints, by motion may be heated and reſolved. If there be any default in the members either in conformation, conſtruction or ſociety with thoſe that are adjoining to them, it muſt be corrected or amended with ſpeed. Moreover, you muſt look whether any of the natural paſſages be ſtopped, or covered with a membrane, as it often happeneth. For if any ſuch cover or ſtop the orifices of the ears, noſtrils, mouth, yard or womb, it muſt be cut in ſunder by the Chirurgion, and the paſſage muſt be kept open by putting in of tents, peſſaries or doſels, leſt otherwiſe they ſhould join together again after they are cut. If he have one finger more than he ſhould naturally, if his fingers do cleave cloſe together, like unto the feet of a Goſe or Duck, if the ligamental membrane that is under the tongue be more ſhort and ſtiffer than it ought, that the infant cannot ſuck, nor in time to come, ſpeak, by reaſon thereof; and if there be any other thing contraryto nature, it muſt be all amended by the induſtry of ſome expert Chirurgion.

The defaults of conformation muſt be ſpeedily amended.

Many times in children newly born, there ſticketh on the inner ſide of their mouth and on their tongue, a certain chalky ſubſtance, both in colour and in conſiſtence; this effect 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 jaws, and even unto the throat, and unleſs it be cleanſed ſpeedily, will be their death. For remedy whereof, it muſt be 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, hony and ſugar. For by rubbing this gently on it, the filth may be mollified, and ſo cleanſed or waſhed away.

Remedies for the Cancer in a childs mouth.

Moreover it will be very meet and convenient to give the infant one ſpoonful of oil of almonds, to make his belly looſe and ſlippery, to aſſwage the roughneſs of the weaſon and gullet, and to diſſolve the tough phlegm, which cauſeth a cough, and ſometimes difficulty of breathing. If the eye-lids cleave together, or if they be joined together, or agglutinated to the coats *cornea* or *aduata*; if the watery tumor called *hydrocephalos* affect the head, then muſt they be cured by the proper remedies formerly preſcribed, againſt each diſeaſe.

Many

Many from their birth have ſpots or marks, which the common people of *France* call *Signes*, that is, marks or ſigns. Some of theſe are plain and equal with the skin, others are raiſed up in little tumors, and like unto warts, ſome have hairs upon them, many times they are ſmooth, black or pale; yet for the moſt part red. When they riſe in the face, they ſpread abroad thereon many times with great deformity. Many think the cauſe thereof to be a certain portion of menſtrual matter cleaving to the ſides of the womb, coming of a freſh flux, if happily a man do yet uſe copulation with the woman, or elſe 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 being drawn out of the ſeminal body, with their own colour. Women refer the cauſe thereof unto their longing when they are with child; which may imprint the image of the thing they long for or deſire, in the child or iſſue that is not as yet formed (as the force and power of imagination in humane bodies is very great:) but when the child is formed, no imagination is able to leave the impreſſion of any thing in it, no more than it could cauſe horns to grow on the head of King *Clypus* as he ſlept preſently after he was returned from attentively beholding Bulls fighting together. An old fable of King *Clypus*. Some of thoſe ſpots be curable, others not; as thoſe that are great, and thoſe that are on the lips, noſtrils, and eye-lids. But thoſe that are like unto warts, becauſe they are partakers of a certain malign quality and melancholick matter, which may be irritated by endeavouring to cure them, are not to be medled with at all, for being troubled and angered, they ſoon turn into a Cancer (which they call *Noli me tangere*) thoſe that are curable are ſmall, and in ſuch parts as they may be dealt withall without danger. Therefore they muſt be pierced through by the roots with a needle and a thred, and ſo being lifted up by the ends of the thred, they muſt be cut away, and the wound that remaineth muſt be cured according to the general method of wounds. Which uncurable. Which and how they are curable.

There are ſome that ſuppoſe the red ſpots that are raiſed up into little knobs and bunches, may be waſhed away and conſumed by rubbing and anointing them often with menſtrual bloud, or the bloud of the ſecundine or after-birth. Thoſe that are hairy and ſomewhat raiſed up like unto a *Want* or Mouſe, muſt be pierced through the roots in three or four places, and ſtraitly bound, ſo that at length being deſtitute of life and nutriment, they may fall away: after they are faln away, the ulcer that remaineth muſt be cured as other ulcers are. If thereby any ſuperfluous fleſh remain, it muſt be taken away by applying *Ægyptiacum*, or the powder of Mercury, and ſuch like: but if it be doubted that it cometh from the root of the tumor that may haply remain, it muſt be burned away by the root with oyl of vitriol or *aqua fortis*.

There is alſo another kind or ſort of ſpots, of a livid or violet colour, coming eſpecially in the face about the lips, with a ſoft, flack, lax, thin, and unpainful tumor, and the veins as if they were varicous round about it. This kind of tumor groweth greater when it ariſeth on children that are wayward and crying, and in men of riper years that are cholerick and angry, and then it will be of a diverſe colour, like unto a lappet and flap of fleſh that hangeth over the Turky-cocks bill. When they have done crying, or ceaſed their anger, the tumor will return to his own natural colour again. But you muſt not attempt to cure it in people that are of theſe conditions.

CHAP. XVIII.

How to pull away the ſecundine or after-birth.

I Suppoſe that they are called ſecundines, becauſe they do give the woman that is with child the ſecond time, as it were a ſecond birth; for if there be ſeveral children in the womb at once, and of different ſexes, they then have every one their ſeveral ſecundines, which thing is very neceſſary to be known by all Midwives. For they do many times remain behind in the womb when the child is born, either by reaſon of the weakneſs of the woman in travail, which by contending and labouring for the birth of the child, hath ſpent all her ſtrength: or elſe 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 ways or paſſages are ſtopped and made more narrow, ſo that nothing can come forth: or elſe becauſe they are doubled and folded in the womb, and the waters gone out from them with the infant, ſo that they remain as it were in a dry place: or elſe becauſe 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 be 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 be pulled away but by violence; but at the prefixed natural time of the birth it may eaſily be drawn away. Why it is called the ſecundine. The cauſes of the ſtaying of the ſecundines.

Many 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 be pulled away with ſpeed from the womb, gently handling the navel, if it may be ſo poſſibly done. But if it cannot be done ſo, the woman muſt be placed as ſhe was wont when that the child will not come forth naturally, but muſt be drawn forth by art. Therefore the midwife having her hand anointed with oil, muſt put it gently into the womb, and finding out the navel-ſtring, muſt follow it until it come unto the ſecundine, and if it do as yet cleave to the womb by the Cotyledons, ſhe muſt ſhake and move it gently up and down, that ſo when it is ſhaken and looſed, ſhe may draw it out gently; but if it ſhould be drawn with violence, it were to be feared leſt that the womb ſhould alſo follow: for by violent attraction ſome of the veſſels, and alſo ſome of the nervous ligaments, whereby the womb is faſtned on each ſide may be rent, whereof followeth the corruption of blood ſhed out of the veſſels, and thence cometh 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 Accidents that follow the ſtaying of the ſecundines. The manner of drawing out the ſecundines that remain after the birth. The cauſe of the falling down of the womb.

neither is there any leſs danger of the falling down of the womb. If that there be any knots or clods of bloud remaining together with the ſecundine, the Midwife muſt draw them out one by one, ſo that not any may be left behind.

The accidents that come of the violent pulling of the womb, together with the ſecundine.

Some women have voided their ſecundine, when it could not be drawn forth by any means, long after the birth of the child, by the neck of their womb, piece-meal, rotten and corrupted, with many grievous and painful accidents. Alſo it ſhall be very requiſite to provoke the endeavour of the expulſive faculty by ſternutatories, aromatick fomentations of the neck of the womb, by mollifying injections: and contrariwiſe, by applying ſuch things to the noſtrils as yield a rank ſavor or ſmell, with a potion made of mug-wort and bay-berries taken in hony 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 terms or courſes.

CHAP. XIX.

What things muſt be given to the infant by the mouth, before he be permitted to ſuck the teat or dug.

To draw flegm from the childs mouth.

IT will be very profitable to rub all the inner ſide of the childs mouth and palat gently with treacle and hony, or the oil of ſweet almonds extracted with fire, and if you can, to cauſe it to ſwallow ſome of thoſe things: for thereby much flegmatick moiſture will be drawn from the mouth, and alſo will be moved or provoked to be vomited up from the ſtomach; for if theſe excremental humors ſhall be 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 many excremental things in the ſtomach and guts of children by this, becauſe that ſo ſoon as they come into the world, and often before they ſuck milk or take any other thing, they void downwards many excrements diverſly coloured, as yellow, green and black. Therefore many, that they may ſpeedily evacuate the matter that cauſeth the fretting of the guts, do not only miniſter thoſe things fore-named, but alſo ſome laxative ſyrup, as that that is made of damask-Roſes. But before the infant be put to ſuck the mother, it is fitting to preſs ſome milk out of her breſt into its mouth, ſo that ſo the fibres of the ſtomach may by little and little accuſtom themſelves to draw in the milk.

Milk ſoon corrupted in a flegmatick ſtomach.

CHAP. XX.

That mothers ought to nurſe or give ſuck unto their own children.

The mothers milk is moſt familiar for the child.

THat all mothers would nurſe their own children were greatly to be wiſhed; for the Mothers milk is far more familiar nouriſhment for the infant than that of any Nurſe: for it is nothing elſe but the ſame blood made white in the dugs, wherewith before it was nouriſhed in the womb. For the mother ought not to give the child ſuck for the ſpace of a few days after the birth, but firſt to expect the perfect expurgation and avoiding of the excremental humors. And in the mean time let her cauſe her breſts to be ſucked of another, or many other children, or of ſome wholſome or ſober maid, whereby the milk may be drawn by little and little unto her breſts, and alſo by little and little purified.

For a certain ſpace after the birth, the milk will be troubled, and the humors of the body moved: ſo that by long ſtaying in the dugs, it will ſeem to degenerate from its natural goodneſs as the groſneſs of it is ſomewhat congealed, the manifeſt heat in touching, and the yellow colour thereof teſtifieth evidently. Therefore it is neceſſary that others ſhould come in place thereof when it is ſucked out, wherewith the infant may be nouriſhed. But if the mother or the Nurſe chance to take any diſeaſe, as a Feaver, Scouring, or any ſuch like, let her give the child to another to give it ſuck, leſt that the child chance to take the Nurſes diſeaſes. And moreover, mothers ought to nurſe their own children, becauſe for the moſt part they are far more vigilant and careful in bringing up and attending their children than hired and mercenary Nurſes, which do not ſo much regard the infant, as the gain they ſhall have by the keeping of it, for the moſt part. Thoſe that do not nurſe their own children, cannot rightly be termed mothers: for they do not abſolutely perform the duty of a mother unto the child, as *Marcus Aurelius* the Roman Emperor was wont to ſay. For it is a certain unnatural, imperfect and half kind of mothers duty, to bear a child, and preſently to abandon or put it away as if it were forſaken: to nouriſh and feed a thing in their womb (which they neither know nor ſee) with their own bloud, and then not to nouriſh it when they ſee it in the world alive, a creature or reaſonable ſoul, now requiring the help and ſuſtentation of the mother.

The diſeaſe of the Nurſe is participated unto the child.

Gal. lib. 11. cap.

CHAP. XXI.

Of the choice of Nurſes.

MAny husbands take ſuch pity on their tender wives, that they provide Nurſes for their children, that unto the pains that they have ſuſtained in bearing them, they may not alſo add the trouble of nurſing them: wherefore ſuch a Nurſe muſt be choſen which hath had two or three children. For the dugs which have been already ſucked and accuſtomed to be filled, have the veins and arteries more large and capable to receive the more milk. In the choice of a Nurſe there is ten things to be conſidered very diligently, as her age, the habit of her body, her behaviour, the

the condition of her milk, the form not only of her dugs or breasts, but also of her teats or nipples, the time of her child-birth, the sex of her last infant or child, that she be not with child, that she be sound and in perfect health. As concerning her age; she ought not to be under twenty five years, nor above thirty five: the time that is between is the time of strength, more temperate and more wholsome and healthy, and less abounding with excremental humors. And because her body doth not then grow or increase, she must of necessity have the more abundance of blood. After thirty five years in many the menstrual fluxes do cease, and therefore it is to be supposed that they have the less nutriment for children. The best age of a Nurse.

The Nurse also must be of good habit, or square or well set body, her breast broad, her colour lively, not fat, nor lean, but well made, her flesh not soft and tender, but thick, and hard or strong, whereby she may be the more able to endure watching and taking of pains about the child; she must not have a red or freckled face, but brown or somewhat shadowed, or mixed with redness: for truly such women are more hot than 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 Choronensis*, *Lib. de lact. nutr.* as blackish or brown ground is more fertile than the white: even so a brown woman hath more store of milk. You must look well on her head, lest she should have the scurf or running sores; see that her teeth be not foul or rotten, nor her breath stinking, nor no ulcer nor sore about her body, and that she be not born of gouty or leprous Parents. The best habit of body in a Nurse.

She ought to be quick and diligent in keeping the child neat and clean, chaste, sober, merry, always laughing and smiling on her Infant, often singing unto it, and speaking distinctly and plainly, for she is the only Mistress to teach the child to speak. Let her be well manner'd, because the manners of the Nurse are participated unto the Infant together with the milk. For the whelps of dogs, if they do suck Wolves or Lionesses, will become more fierce and cruel than otherwise they would. Contrariwise, the Lions whelps will leave their savageness and fierceness, if that they be brought up and nourished with the milk of any Bitch, or other tame beast. If a Goat give a Lamb suck, the same Lambs wool will be more hard than others; contrariwise, if a sheep give a Kid suck, the same Kids hair will be more soft than another Kids hair. She ought to be sober, and the rather for this cause, because many Nurses being overladen with wine and banquetting, often set their children unto their breasts to suck, and then fall asleep, and so suddenly strangle or choak them Of what behavior the Nurse must be.

She must abstain from copulation: for copulation troubleth and moveth the humors and the bloud, and therefore the milk it self, and it diminisheth the quantity of milk, because it provoketh the menstrual flux, and causeth the milk to have a certain strong and virulent quality, such as we may perceive to breath from them that are incensed with the fervent lust and desire of Venery. And moreover, because that thereby they may happen to be with child, whereof ensueth discommodity both to her own child that is within her body, and also to the Nurse-child: to the Nurse-child, because that the milk that it sucketh will be worse and more depraved that otherwise it would be, by reason that the more laudable bloud 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 child, because it will cause it to have scarcity of food; for so much as the sucking child sucketh, so much the child conceived in the womb wanteth. Why the Nurse must abstain from copulation.

Also she 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, because that in firm flesh the heat is more strong and compact. You may by touching try whether the flesh be solid and firm, as also by the dispersing of the veins, easily to be seen by reason of their swelling and blewness, through the dugs, as it were into many streams or little rivulets; for in flesh that is loose and slack, they lie hidden. Those dugs that are of a competent bigness, receive or contain no more milk than 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 child in sucking can scarce draw it out, and moreover, if the dugs be hard, the child putting his mouth to the breast, may strike his nose against it, and so hurt it, whereby he may either refuse to suck, or if he doth proceed to suck, by continual sucking, and placing of his nose on the hard breast, it may become flat, and the nostrils turned upwards, to his great deformity, when he shall come to age. If the teats or nipples of the dugs do stand somewhat low or depressed inwards on the tops of the dugs, the child can hardly take them between its lips, therefore his sucking will be very laborious. If the nipples or teats be very big, they will so fill all his mouth, that he cannot well use his tongue in sucking or in swallowing the milk. What dugs a Nurse ought to have.

We may judg of or know the nature and condition of milk, by the quantity, quality, colour, savor and taste; when the quantity of the milk is so little, that it will not suffice to nourish the infant, it cannot be good and laudable; for it argueth some distemperature either of the whole body, or at least of the dugs, especially a hot and dry distemperature. But when it superaboundeth, and is more than the infant can spend, it exhausteth the juice of the Nurses body, and when it cannot all be drawn out by the infant, it clottereth, and congealeth or corrupteth in the dugs. Yet I would rather wish it to abound, than to be defective, for the superabounding quantity may be prest out before the child be set to the breast. What is to be observed in the milk.

That milk that is of a mean consistence between thick and thin, is esteemed to be the best. For it betokeneth the strength and vigor of the faculty that engendreth it in the breasts. Therefore if one drop of the milk be laid on the nail of ones thumb, being first made very clean and fair, if the thumb be not moved, and it run off the nail, it signifieth that it is watery milk: but if it stick to the nail, although the end of the thumb be 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 The laudable consistence of the milk.

when

when you hold it a little aside or downwards by little and little, it sheweth it is very good milk. And that which is exquisitely white, is best of all. For the milk is no other thing than bloud made white.

Why the milk ought to be very white.

Therefore, if it be of any other colour, it argueth a default in the bloud: so that if it be brown, it betokeneth melancholik bloud; if it be yellow, it signifieth cholerick bloud; if it be wan and pale, it betokeneth phlegmatick bloud; if it be somewhat red, it argueth the weakness of the faculty that engendreth the milk. It ought to be 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 be 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 caused the bloud wherewith the child should be nourished to be turned into milk: which unless it were so, who is he that would not turn his face from, and abhor so grievous and terrible a spectacle of the childs mouth so imbrued and besmeared with bloud? what mother or Nurse would not be amazed at every moment with the fear of the blood so often shed out, or sucked by the infant for his nourishment? Moreover, we should want two helps of sustentation, that is to say, Butter and Cheese.

Why a woman that hath red hair, or freckles on her face cannot be a good Nurse.

Neither ought the child to be permitted to suck within five or six days after it is born, both for the reason before alledged, and also because he hath need of so much time to rest quiet, and ease himself after the pains he hath sustained in his birth: in the mean season the mother must have her breasts drawn by some maid that drinketh no wine, or else she may suck or draw them her self with an artificial instrument which I will describe hereafter.

Why that Nurse that hath born a man child is to be preferred before another Why she cannot be a good Nurse whose child was born before the time.

That Nurse that hath born a man child, is to be preferred before another, because her milk is the better concocted, the heat of the male child doubling the mothers heat. And moreover, the women that are great with child of a male child, are better coloured, and in better strength, and better able to do any thing all the time of their greatness, which proveth the same: and moreover the blood is more laudable, and the milk better. Furthermore it behoveth the Nurse to be brought on bed, or to travail at her just and prefixed or natural time: for when the child is born before his time of some inward cause, it argueth that there is some default lurking and hidden in the body and humors thereof.

CHAP. XXII.

What diet the Nurse ought to use, and in what situation she ought to place the infant in the Cradle.

BOth in eating, drinking, sleeping, watching, exercising and resting, the Nurses diet must be divers, according as the nature of the child both in habit and temperature shall be, as for example, if the child be altogether of a more hot bloud, the Nurse both in feeding and ordering her self ought to follow a cooling diet. In general let her eat meats of good juice, moderate in quantity and quality, 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 mind, but anger especially; let her use moderate exercise, unless it be the excercise of her arms and upper parts, rather than the legs and lower parts, whereby the greater attraction of the blood that must be turned into milk, may be made towards the dugs. Let her place her child so in the Cradle that his head may be higher than all the body, that so the excremental humors may be 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 be straight and equal. As long as the child sucketh, and is not fed with stronger meat, it is better to lay him alway on his back, than any other way, for the back is as it were the keel in a ship, the ground-work and foundation of all the whole body, whereon the infant may safely and eatily rest. But if he lie on the side, it were danger left that the bones of the ribs being 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 become crook-backed. But when he beginneth to breed teeth, and to be fed with more strong meat, and also the bones and connexions of them begin to wax more firm and hard, he must be layed one while on this side, another while on that, and now and then also on his back. And the more he groweth, the more let him be accustomed to lie on his sides; and as he lieth in the Cradle, let him be turned unto that place whereat the light cometh in, left that otherwise he might become purblind, for the eye of its own nature is bright and lightsome, and therefore always desireth the light, and abhorreth darkness; for all things are most delighted with their like, and shun their contraries. Therefore unless the light comes directly into the childs face, he turneth the himself every way being very sorrowful, and striveth to turn his head and eyes that he may have the light; and that often turning and rowling of his eyes at length groweth into a custom that cannot be left: and so it cometh to pass that the infant doth either become pur-blind, if he set his eyes stedfastly on one thing, or else his eyes do become trembling, always turning and unstable, if he cast his eyes on many things that are round about him: which is the reason that Nurses, being taught by experience, cause over the head of the child lying in the Cradle, an arch or vault of Wickers covered with cloth to be made, thereby to restrain, direct, and establish the uncertain and wandering motions of the childs eyes.

Anger greatly hurteth the Nurse.

The exercise of the arms is best for the Nurse.

How the child should be placed in the Cradle.

Why an arch of wickers must be made over the childs head lying in the cradle.

If the Nurse be squint-eyed, she cannot look upon the child but side-ways, whereof it cometh to pass that the child being moist, tender, flexible, and prone to any thing with his body, and so likewise with his eye, by a long and daily custom unto his Nurses sight, doth soon take the like

Why a squint-eyed Nurse causeth the child to be squint-eyed.

custom

cuſtom to look after that ſort alſo, which afterwards he cannot leave or alter. For thoſe evil things which we learn in our youth, do ſtick firmly by us; but the good qualities are eaſily changed into worſe. In the eyes of thoſe that are ſquint-eyed, thoſe two muſcles which do draw the eyes to the greater or leſſer corner, are chiefly or more frequently moved. Therefore either of theſe being confirmed in their turning aſide by long uſe, as the exerciſe of their proper office increaſeth the ſtrength, ſoon overcomes the contrary or withſtanding muſcles, called the *Antagoniſts*, and brings them into their ſubjection, ſo that, will they, nill they, they bring the eye unto this or that corner as they liſt. So children become 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 every action therewithall, and ſo bring by the exerciſe thereof more nutriment unto that part. But if men (as ſome affirm) being of ripe years, and in their full growth, by dayly ſociety and company of thoſe that are lame and halt do alſo halt, not minding ſo to do, but it cometh 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 every impreſſion? Moreover, children, as they become lame and crook-backt, ſo do they alſo become ſquint-eyed by the hereditary default of their parents.

How children become left-handed.

CHAP. XXIII.

How to make pap for Children.

PAp is a moſt meet food or meat for children; becauſe they require moiſt nourithment; and it muſt be anſwerable in thickneſs to the milk, that ſo it may not be difficult to be concocted or digeſted. For pap hath theſe three conditions, ſo that it be made with wheaten flower, and that not crude, but boiled: let it be put into a new earthen pot or pipkin, and ſo ſet into an oven at the time when bread is ſet thereinto to be baked; and let it remain there until the bread be baked and drawn out: for when it is ſo baked, it is leſs clammy 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 clammy unto the child, if that the pap be only firſt boiled over the fire in a pipkin or skellet, ſo long as ſhall be neceſſary for the milk; hence come 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 elſe they give the child the milk, deſpoiled of its butteriſh and whayiſh portion, and the terreſtrial, and cheeſe-like, or curd-like remaining, if the pap be boiled ſo long as is neceſſary for the meal: for the milk requireth not ſo great, neither can it ſuffer ſo long boiling as the meal. Thoſ ethat 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 be nouriſhed only with the Nurſes milk, ſo long as the Nurſe hath enough to nouriſh and feed it. And truly there are many children that are contented with milk only, and will receive no pap until they are three months old. If the child at any time be coſtive, and cannot void the excrements, let him have a cataplaſm made with one dram of Aloes, of white and black Hellebore, of each fifteen grains, being 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 apply it upon the navel warm: Moreover, this cataplaſm hath alſo virtue to kill the worms in the belly. Many times children have fretting of the guts, that maketh them to cry, which cometh of crudity. This muſt be cured by applying unto the belly ſweaty or moiſt wooll, macerated in oil of Camomil.

If when the childs teeth begin to grow, he chance to bite the nipple of the Nurſes breaſt, there will be an ulcer very contumacious and hard to be cured; becauſe that the ſucking of the child, and the rubbing of the cloths do keep it always raw; it muſt be 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 many holes in the top, whereat both the milk, and alſo the ſanious matter that cometh from the ulcers may go out; for lead it ſelf will cure ulcers.

Three laudable conditions of pap.

How the meal muſt be prepared to make the pap withall.

Why the meal wherewith the pap muſt be made, muſt firſt be boiled or baked.

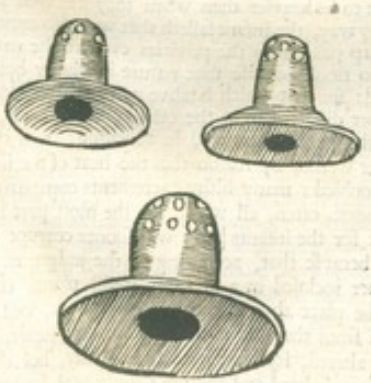
Lib. 1. de ſanit. tuend.

A cataplaſm to relax the childs belly.

For the fretting of the guts in children.

For the ulcers of the nipples or teats.

The figure of leaden Nipples to be put upon the Nipple or Teat of the Nurſe, when it is ulcerated.



Children may be cauſed to ceaſe their crying four manner of ways, that is to ſay, by giving them the teat, by rocking them in a cradle, by ſinging unto them, and by changing the cloaths and ſwathes wherein they are wrapped. They muſt not be rocked too violently in the cradle, leſt that the milk that is ſucked ſhould be corrupted by the too violent motion, by reaſon whereof they muſt not be handled violently any other way, and not altogether prohibited, or not ſuffered to cry. For by crying the breaſt and lungs are dilated, and made bigger and wider; the natural parts the ſtronger, and the brain, noſtrils, the eyes and mouth are purged, by the tears and filth that come from the eyes and noſtrils. But they muſt not be permitted to cry long or fiercely, for fear of breaking the production of the *Peritonæum*, and thereby cauſing 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 *Epiploocle*.

What moderate crying worketh in the infant.

What immoderate crying cauſeth.

CHAP. XXIV.

Of the weaning of Children.

When children muſt be weaned.

MAny are weaned in the eighteenth month, ſome 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 ſome harder meat than 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 ſome will appear ſooner, and ſome later; for they are prepared of nature for no other purpoſe than to chaw the meat. If children be weaned before their teeth appear, and be fed with meat that is ſomewhat hard and ſolid, according to the judgment of *Avicen*, they are incident to many diſeaſes coming through crudity; becauſe 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 child is two years old, and the teeth appear, if the child more vehemently deſire harder meats, and doth feed on them with pleaſure and good ſucceſs, he may be ſafely weaned: for it cannot be ſuppoſed that he hath this appetite of hard meats in vain, by the inſtinct of nature. Yet he may not be weaned without ſuch an appetite, if all other things be correſpondent, that is to ſay, his teeth and age; for thoſe things that are eaten without an appetite, cannot profit. But if the child be weak, tickly, or feeble, he ought not to be weaned. And when the meet time of weaning cometh, the Nurſe muſt now and then uſe him to the teat, whereby he may leave it by little and little, and then let the teat be anointed or rubbed with bitter things, as with Aloes, water of the infuſion of *Colocynthus*, or Worm-wood, or with Muſtard, or Soot ſteeped in water, or ſuch like. Children that are ſcabby in their heads, and over all their bodies, and which void much phlegm at their mouth and noſtrils, and many excrements downwards, are like to be ſtrong and ſound of body; for ſo they are purged of excremental humors: contrariwiſe, thoſe that are clean and fair of body, gather the matter of many 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 many become crook-backt.

Why children muſt not be weaned before their teeth appear.

How children muſt be weaned.

What children are ſtrong and ſound of body

An often cauſe of ſudden crookedneſs.

CHAP. XXV.

By what ſigns it may be known whether the child in the womb be dead or alive.

A moſt certain ſign of the child dead in the womb.

IF neither the Chirurgions hand, nor the mother can perceive the infant to move, if the waters be flowed out, and the ſecundine come forth, you may certainly affirm that the infant is dead in the womb, for this is the moſt infallible ſign of all others: for becauſe the child in the womb doth breath but by the artery of the navel, and the breath is received by the *Cotyledon* of the arteries of the womb, it muſt of neceſſity come to paſs that when the ſecundine is ſeparated from the infant, no air nor breath can come unto it. Wherefore ſo often as the ſecundine is excluded before the child, you may take it for a certain token of the death thereof: when the child is dead, it will be more heavy to the mother than it was before when it was alive, becauſe it is now no more ſuſtained by the ſpirits and faculties wherewith before it was governed and ruled, for ſo we ſee dead men to be heavier than thoſe that are alive, and men that are weak through hunger and famine to be heavier than when they are well refreſhed, and alſo when the mother inclines her body any 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 making water, and going to ſtool, becauſe 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, becauſe the one is altogether different from the other; but likeneſs, if any thing, conjoins and unites things together: the genitals are cold in touching, and the mother complaineth that ſhe feeleth a coldneſs in her womb, by reaſon that the heat of the infant is extinguiſhed, wherewith before her heat was doubled: many filthy excrements come from her, and alſo the mothers breath ſtinketh, ſhe ſwoundeth often, all which for the moſt part happen within three days after the death of the child: for the infants body will ſooner corrupt in the mothers womb than it would in the open air, becauſe that, according to the judgment of *Galen*, all hot and moiſt things, being in like manner incloſed in a hot and moiſt place, eſpecially if by reaſon of the thickneſs or ſtraitneſs of the place they cannot receive the air, will ſpeedily corrupt. Now by the riſing up of ſuch vapors from the dead unto the brain and heart, ſuch accidents may ſoon follow, her face will be clean altered, ſeeming livid and ghaſtly, her dugs fall and hang looſe and lank, and her belly will be more hard and ſwollen than it was before. In all bodies ſo putrifying,

When the child is dead in the womb he is more heavy than he was before being alive.

That which is alive will not ſuffer that which is dead.

Lib. de tumorib.

ing, the natural heat vanisheth away, and in place thereof succeedeth a preternatural, by the working whereof the putrified and dissolved humors are stirred up into vapors, and converted into wind, and those vapors, because 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 putrified body into a greater bigness. You may note the same thing in bodies that are gangrenate, for they cast forth many sharp vapors, yet nevertheless they are swollen and puffed up.

Why the belly of a woman will be more big when the child is dead within her than it was before when it was alive.

Now so soon as the Chirurgion shall know that the child is dead by all these fore-named signs, he shall with all diligence endeavor to save the mother so speedily as he 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 he perceive that she be weak and feeble by the smalness of her pulse, by her small, seldom and cold breathing, and by the altered and death-like colour in her face, by her cold sweats, and by the coldness of the extreme parts, let him abstain from the work, and only affirm that she will die shortly; contrariwise, if her strength be yet good, let him with all confidence and industry deliver her on this wise from the danger of death.

The signs of a woman that is weak.

CHAP. XXVI.

Of the Chirurgical extractions of the child from the womb either dead or alive.

THerefore first of all the air of the chamber must be made temperate, and reduced unto a certain mediocrity, so that it may neither be too hot nor too cold. Then she must be aptly placed, that is to say, overthwart the bed side, with her buttocks somewhat high, having a hard stuffed pillow or boulster under them, so that she may be in a mean figure of situation, neither sitting altogether upright, nor altogether lying along on her back; for so she may rest quietly, and draw her breath with ease, neither shall the ligaments of the womb be extended so as they would if she lay upright on her back, her heels must be drawn up close to her buttocks, and there bound with broad and soft linnen rowlers. The rowler must first come about her neck, and then cross-wise over her shoulders, and so to the feet, and there it must cross again, and so be rowled about the legs, thighs, and then it must be brought up to the neck again, and there made fast, so that she may not be able to move her self, even as one should be tied when he is to be cut of the stone. But that she may not be wearied, or left that her body should yield or sink down as the Chirurgion draweth the body of the infant from her, and so hinder the work, let him cause her feet to be set against the side of the bed, and then let some 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 be done with the more decency, her privy parts and thighs must be covered with a warm double linnen cloth. Then must the Chirurgion, having his nails closely pared, and his rings (if he wear any) drawn off his fingers, and his arms naked, bare, and well anointed 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, having first made it gentle and slippery with much oil; and when his hand is in, let him find out the form and situation of the child, whether it be one or two, or whether it be a Mole or not. And when he findeth that he cometh naturally with his head toward the mouth or orifice of the womb, he must lift him up gently, and so turn him that his feet may come forwards, and when he hath brought his feet forwards, he must draw one of them gently out at the neck of the womb, and then he must bind it with some broad and soft or silken band a little above the heel with an indifferent slack knot, and when he hath so bound it, he must put it up again into the womb, then he must put his hand in again, and find 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 he had before tied the one end of the band, and when he hath them both out, let him join them both close together, and so by little and little let him draw all the whole body from the womb. All other women or Midwives may help the endeavour of the Chirurgion, by pressing the patients belly with their hands downwards as the infant goeth out: and the woman her self by holding her breath, and closing her mouth and nostrils, and by driving her breath downwards with great violence, may very much help the expulsion. I wish him to put back the foot into the womb again after he hath tied it, because if that he should permit it to remain in the neck of the womb, it would hinder the entrance of his hand when he putteth it in to draw out the other. But if there be two children in the womb at once, let the Chirurgion take heed left that he take not of either of them a leg: for by drawing them so, he shall profit nothing at all, and yet exceedingly hurt the woman. Therefore that he may not be so deceived, when he 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 child, and then from thence he may soon find out the other foot of the same child: for if it should happen otherwise, he might draw the legs and the thighs out: but it would come no further, neither is it meet that he should come out with his arms along by his sides, or be drawn out on that sort, but one of his arms must be stretched out above his head, and 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 be when his body should be drawn out with his arms along by his sides, would so shrink and draw it self when the body should come unto the neck, only by the accord of nature requiring union, that it would strangle and kill the infant so that it cannot be drawn therehence unless it be with a hook put under, or fastned under his chin, in his mouth, or in the hollowness of his eye. But if the infant lieth as if he would come with his hands forwards, or if his hands be forth already, so that it may seem he may be drawn forth easily that way, yet it must not be so done; for so his head would double backwards over his shoulders, to the great danger of his

After what sort the woman in travail must be placed when the child being dead in her womb must be drawn out.

How she must be bound.

How the Chirurgion ought to prepare himself and his patient to the drawing out of the child from the womb.

How the infant that is dead in the womb must be turned, bound and drawn out.

A caution to avoid strangling of the infant in drawing out the body.

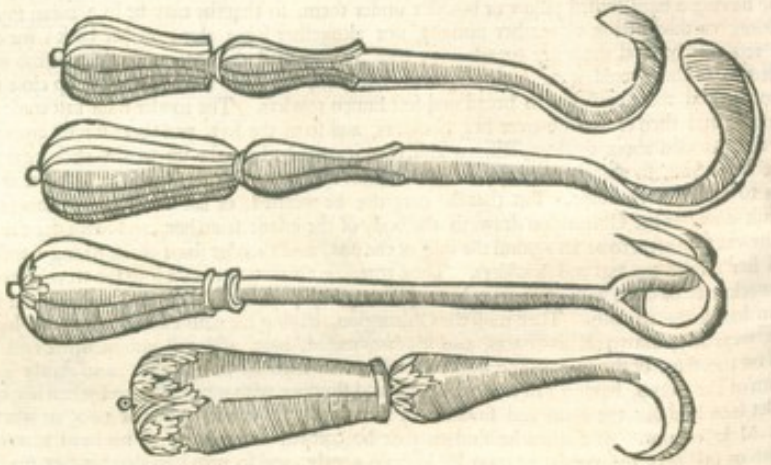
Why the child must not be drawn out with his hands forwards.

An hiſtory.

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 the child died; I told them preſently that his arm muſt be put in again, and he muſt be turned otherwiſe. But when it could not be put back by reaſon of the great ſwelling thereof, and alſo of the mothers genitals, I determined to cut it off with an inciſion knife, cutting the muſcles as near as I could to the ſhoulder, yet drawing the fleſh upwards, that when I had taken off the bone with a pair of cutting pincers, it might come 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 being done, I turned him with his feet forwards, and drew him out as is before ſaid. But if the tumor either naturally or by ſome accident, that is to ſay, by putrefaction, which may perchance come, be ſo great that he cannot be turned according to the Surgeons intention, nor be drawn out according as he lieth, the tumor muſt be diminiſhed, and then he muſt be drawn out as is aforeſaid, and that muſt be done 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 being more great and puffed up with wind ſo that it cannot come forth, as cauſed to be ſo through that diſeaſe which the Grecks call *Meteorhiſcecephalos*, the Surgeon muſt faſten a hook under his chin, or in his mouth, or elſe in the hole of his eye, or elſe, which is better and more expedient, in the hinder part of his head. For when the ſcull is ſo opened, there will be a paſſage whereat the wind may paſs out, and ſo when the tumor falleth and decreaſeth, let him draw the infant out by little and little; but not raſhly, leſt he ſhould break that whereon he hath taken hold: the figure of thoſe hooks is thus.

To diminiſh the wind wherewith the infant being dead in the womb, ſwelleth and is puffed up that he cannot be gotten out of the womb.

The form of Hooks for drawing out the infant that is dead in the womb.



But if the breaſt be troubled with like fault, the hooks muſt be faſtned about the chanel-bone: if there be a Dropſie or Tympany in the belly, the hooks muſt be faſtned either in the ſhort ribs, that is to ſay, in the muſcles that are between the ribs, or eſpecially, if the diſeaſe do alſo deſcend into the feet, about the bones that are above the groin; or elſe putting the crooked knife here pictured into the womb with his left hand, let him make inciſion in the childs belly, and ſo get out all his entrails by the inciſion: for when he is ſo bowelled, all the water that cauſed the Dropſie will out. But the Surgeon muſt do none of all theſe things but when the child is dead, and the woman that travelleth in ſuch danger that ſhe cannot handſomely be holpen.

How the head of the infant if it remain in the womb ſeparated from the body, may be drawn out.

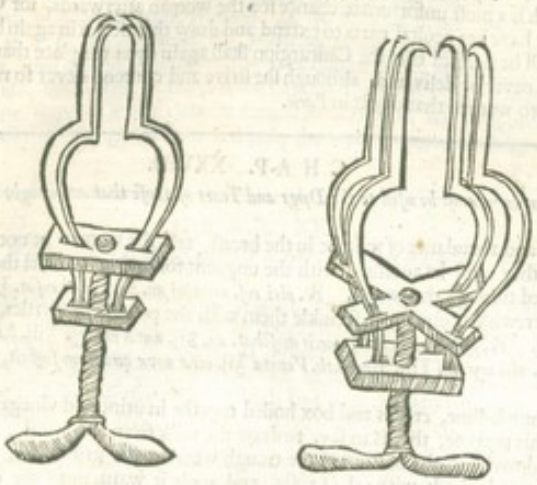
But if by any means it happeneth, that all the infants members be cut away by little and little and that the head onely remaineth behind in the womb, which I have ſometimes againſt my will, and with great ſorrow ſeen; then the left hand, being anointed with oil of Lillies, or freſh Butter, muſt be put into the womb, wherewith the Surgeon muſt find out the mouth, putting his finger into it; then with his right hand he 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, eye, or under the chin; and when he hath firmly fixed or faſtened it, he muſt therewith draw out the head by little and little, for fear of looſening or breaking the part whereon he hath hold. In ſtead of this Hook, you may uſe the inſtruments that are here deſcribed, which therefore I have taken out of the Surgery of *Francis Dalechamps*; for they are ſo made, that they may eaſily take hold of a ſpherical and round body with the branches, as with fingers.

Why the head being alone in the womb, is more difficult to be got out.

But it is not very eaſie to take hold on the head when it remaineth alone in the womb, by reaſon of the roundneſs thereof, for it will ſlip and ſlide up and down, unleſs the belly be preſſed down, and on both ſides, thereby to hold it unto the inſtrument, that it may with more facility take hold thereon.

Gryphon's

Gryphon's Talons, *that is to say, Instruments made to draw out the head of a dead infant that is seperated in the womb from the rest of the body.*



CHAP. XXVII.

What must be done unto the woman in travail presently after her deliverance.

THere is nothing so great an enemy to a woman in travail, especially to her whose child is drawn away by violence, as cold: wherefore with all care and diligence she must be kept and defended from cold. For after the birth, her body being void and empty, doth easily receive the air that will enter into any thing that's empty, and hence she waxeth cold, her womb is distended and puffed up, and the orifice, or the vessels thereof are shut and closed, whereof cometh suppression of the after-birth, or other after-purgations. And thereof cometh many grievous accidents, as hysterical suffocation, painful fretting of the guts, fevers, and other mortal diseases.

Cold an enemy to women in travail.

What accidents follow the taking of cold in a woman that is delivered of child.

What woman soever will avoid that discommodity, let her hold her legs or thighs across; for in so doing, those parts that were separated will be joined and close together again. Let her belly be also bound or rowled with a ligature of an indifferent bredth or 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 some Capon-broth or Caudle, with Saffron, or with the powder called *Pulvis ducis*, or else 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 be laid warm unto the region of the womb, especially in the winter, but in the Summer the hot skin of a weather newly killed must be laid unto the whole belly, and unto the region of the loins. But then the curtains must be kept drawn, and all the windows and doors of the chamber must be kept shut with all diligence, that no cold air may come unto the woman that travaileth, but that she may lie and take her rest quietly. The Weathers skin must be taken away after that it hath lain five or six hours, and then all the region of her belly must be anointed with the ointment following.

Secundines must be laid to the region of the womb whilst they be warm.

℞. *Spermatis Ceti*, ℥ij. *olei amygdal. dulcium & hypericon. an.* ℥iß. *sevi hircini*, ℥j. *olei myrtillor.* ℥j. *ceræ novæ quantum sufficit*; make thereof an ointment, wherewith let her be anointed twice in the day: let a plaister of *Galbanum* be applied to the navel, in the midst whereof put some few grains of Civet or Musk, so that the smell of the plaister may not strike up into her nostrils. Then let this medicine following be applied, commonly called *Tela Gualterin.* ℞. *ceræ novæ*, ℥iv. *Spermatis Ceti*, ℥iß. *terebinth. Venetæ in aquæ rosaceæ lotæ*, ℥ij. *olei amygdal. dulcium & hypericonic. an.* ℥j. *olei majoric. & 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 serve to fit the region of the belly, whereunto it is to be applied. These remedies will keep the external region of the belly from wrinkling.

Unguents for the woman in travail that the region of the belly may not be wrinkled.

The medicine called *Tela Gualterina.*

But of all other, the medicine following excelleth. ℞. *limacum rub.* ℔j. *florum anthos quart.* iv. let them be cut all in small pieces, and put into an earthen pot well sealed with lead, and close stopped, then let it be set in the dung of horses for the space of forty days, and then be pressed or strained, and let the liquor that is strained out be kept in a glass well covered, and set in the Sun for the space of three or four days, and therewith anoint the belly of the woman that lieth in child-bed. If she be greatly tormented with throws, let the powder following be given unto her. ℞. *anisi conditi* ℥iij. *nucis moschat. cornu cervi ust. an.* ℥jß. *nucleorum dactylor.* ℥iij. *ligni aloes & cinnamomi, an.* ℥ij. make thereof a most subtil powder, let her take ℥j. thereof at once with white wine warm. Or, ℞. *rad. consolidæ major.* ℥iß. *nucleorum persicorum, nucis moschat. an.* ℈ij. *carab.* ℈ß. *ambræ græcæ grn.* iv. make thereof a powder, let her take one dram thereof at a time with white wine, or if she have a feaver, with the broth of a Capon. Let there be hot bags applied to the genitals, belly and reins; these bags must be made of millet and oats fried in a frying pan with a little white wine.

A powder for the fretting of the guts.

What muſt be done when the groin is torn in child-birth.

But if through the violence of the extraction the genital parts be torn, as antient writers affirm it hath come to paſs, ſo that the two holes, as the two holes of the privy parts and of the fundament have been torn into one, then that which is rent muſt be ſtitched up, and the wound cured according to art. Which is a moſt unfortunate chance for the woman afterwards, for when ſhe ſhall travail again, ſhe cannot have her genital parts to extend and draw themſelves in again by reaſon of the ſcar. So that then it will be needful that the Chirurgion ſhall again open the place that was cicatrized, for otherwiſe ſhe ſhall never be delivered, although ſhe ſtrive and contend never ſo much. I have done the like cure in two women that dwelt in *Paris*.

CHAP. XXVIII.

What cure muſt be 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 be in the breaſt, and the woman be not willing to nurſe her own child, they muſt be anointed with the unguent following to repel the milk, and cauſe it to be expelled through the womb. ℞. *olei roſ. myrtini an.* ℥iij. *aceti roſat.* ℥j. incorporate them together, and therewith anointing beſprinkle them with the powder of Myrtles, and then apply the plaiſter following. ℞. *pulv. maſtichini, nucis moſchat. an.* ℥ij. *nucis cupreſſi* ℥iij. *balauſt. myrtil. an.* ℥iß. *Ireos, florent.* ℥ß. *olei myrtini* ℥iij. *terebinth. Venetæ* ℥ij. *ceræ novæ quantum ſufficit*, make thereof a ſoft plaiſter.

The leaves of brook-lime, creſſes and box boiled togethe in urine and vinegar, are thought a preſent remedy for this purpoſe, that is to ſay, to draw the milk from the breaſt. And others take the clay that falleth down into the bottom of the trough wherein the grindſtone, whereon ſwords are grownd, turneth, and mix it with oil of roſes, and apply 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-Ivy, Peruwincle, Sage, red Roſes, and Roch Allum being 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 vinegar, or the diſtilled water of unripe Pine-apples applied to the breaſts with linnen cloths wet therein, or hemlock beaten and applied with the young and tender leaves of a gourd.

By what reaſon, and which way cupping-glaſſes being faſtned on the groin or above the navel, do draw milk out of the breaſt.

This medicine following is approved by uſe: Take the leaves of Sage, Smallage, Rue, and Chervil, and cut or chop them very ſmall, and incorporate them in vinegar and oil of Roſes, and ſo apply it warm to the breaſt, and renew it thrice a day. In the mean time let Cupping-glaſſes be applied to the inner ſide of the thigh and groin, and alſo above the navel; For this is very 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, inſtead whereof we have invented this inſtrument of glaſs, wherewith, when the broader orifice is faſtned or placed on the breaſt or dug, and the pipe turned upwards towards her mouth, ſhe may ſuck her own breaſts her ſelf.

The form of a little glaſs, which being put on the nipple, the woman may ſuck her own breaſts.

Inſtead of this inſtrument, a viol of glaſs being 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 being firſt evacuated, which is done for the moſt part within twenty days after the birth, if the woman be not in danger of a feaver, nor have any other accident, let her enter into a bath, made of marjerom, mint, ſage, roſemary, mugwort, agrimony, peny-royal, the flowers of camomil, melilote, dill, being boiled in moſt pure and clear running water. All the day following let another ſuch like bath be prepared, whereunto let theſe things following be added. ℞. *farin. fabarum & aven. an.* ℔ iij. *farin. erobi, lupinor. & gland. an.* ℔j. *aluminis roch.* ℥iv. *ſalis com.* ℔ ij. *gallarum, nucum cupreſſi, an.* ℥iij. *roſar. rub.* m. vi. *caryophil. nucum moſchat. an.* ʒiij. 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 ſhe pleaſeth and when ſhe cometh out, let her be laid warm in bed, and let her take ſome 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 come forth of its own accord.

Aſtringent fomentations for the privy parts

On the next day let aſtringent fomentations be applied to the genitals on this wiſe prepared. ℞. *gallar. nucum cupreſſi, corticum granat. an.* ℥j. *roſar. rub.* m.j. *thymi, majoran. an.* m. ℈. *aluminis rochæ, ſalis com. an.* ʒij. boil them all together in red wine, and make thereof a decoction for a fomentation.

fomentation, for the forenamed uſe. The diſtilled liquor following is very excellent and effectual to confirm and to draw in the dugs, or any other looſe parts. ℞. *caryophil. nucis moſchat. nucum cupreſſi an.* ʒiſ. *maſtich.* ℥ij. *alumin. roch.* ʒiſ. *glandium & corticis querni. an.* ℔ß. *roſar. rubr.* m. j. *cort. granat.* ℥ij. *terræ ſigillat.* ℥j. *cornu cervi uſti* ℥ß. *myrtillor. ſanguinis draconis. an.* ℥j. *boli armeni.* ʒij. *ireos florent.* ℥j. *ſumach. berber. Hippuris, an.* m. ß. *conquaſſentur omnia, & macerentur ſpatio dierum decem, in* ℔. ß. *aquæ roſarum* ℔ij. *prunorum ſylveſtr. meſpilorum, pomorum quercinarum, &* ℔ 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 be fomented twice in a day. And after the fomentation let woollen cloths or ſtupes of linnen cloth be dipped in the liquor, and then preſſed out and laid to the place. When all theſe things are done and paſt, the woman may again keep company with her husband.

A diſtilled liquor for to draw together the dugs that are looſe and flack.

CHAP. XXIX.

What the cauſes of difficult and painful travail in child-birth are.

THe fault dependeth ſometimes on the mother, and ſometimes on the infant or child within the womb. On the mother, if ſhe be more fat, if ſhe be given to gormandize or great eating, if ſhe be too lean or young, as *Savanarola* thinketh her to be, that is great with child at nine years of age, or unexpert, or more old, or weaker than ſhe ſhould be either by nature or by ſome accident: as by diſeaſes that ſhe hath had a little before the time of child-birth, or with a great flux of bloud. But thoſe that fall in travail before the full and prefixed time are very difficult to deliver, becauſe the fruit is yet unripe, and not ready or eaſie to be delivered. If the neck or orifice of the womb be narrow, either from the firſt conformation, or afterwards by ſome chance, as by an ulcer cicatrized: or more hard and callous, by reaſon that it hath been torn before at the birth of ſome other child, and ſo cicatrized again, ſo that if the cicatrized place be not cut even in the moment of the deliverance, both the child and the mother will be in danger of death; alſo the rude handling of the midwife may hinder the free deliverance of the child. Oftentimes women are letted in travail by ſhamefacedneſs, by reaſon of the preſence of ſome man, or hate to ſome woman there preſent.

The cauſes of the difficult child-birth that are in the woman that travaileth.

The paſſions of the mind hinder the birth.

If the ſecundine be pulled away ſooner than it is neceſſary, it may cauſe a great flux of blood to fill the womb, ſo that then it cannot perform his excluſive faculty, no otherwiſe than 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 faculty of child-birth is ſtopped or delayed, if together with the ſtopping of the ſecundine, there be either a Mole or ſome other body contrary 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 quantity of ſand like unto that which is found about 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 be the occaſion of difficult child-birth, as, if too big, if it come overthwart, if it come with its face upwards, and its buttocks forwards, if it come with its feet and hands both forwards at once, if it be dead and ſwoln by reaſon of corruption, if it be monſtrous, if it have two bodies or two heads, if it be manifold or ſeven-fold, as *Albucraſis* affirmeth he hath ſeen, if there be a mole annexed thereto, if it be very weak, if when the waters are flowed out, it doth not move nor ſtir, or offer it ſelf to come forth. Yet notwithſtanding, it happeneth ſometimes that the fault is neither in the mother nor the child, but in the air, which being cold, doth ſo bind, congeal and make ſtiff the genital parts, that they cannot be relaxed: or, being contrariwiſe too hot, it weakneth 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 cauſes of difficult child-birth that are in the infant.

The external cauſes of difficult child-birth.

The birth is wont to be eaſie, if it be in the due and prefixed natural time, if the child offer himſelf luſtily to come forth with his head forwards preſently after the waters are come forth, and the mother in like manner luſty and ſtrong: thoſe which are wont to be troubled with very difficult child-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 be anointed with much oil, and the inteſtines that are full and loaded muſt be underburthened of the excrements, and then the expulſive faculty provoked with a ſharp clyſter, and the tumors and ſwelling of the birth concurring therewith, the more eaſie excluſion may be made. But I like it rather better, that the woman in travail ſhould be placed in a chair that hath the back thereof leaning backwards, than in her bed, but the chair muſt have a hole in the bottom, whereby the bones that muſt be dilated in the birth, may have more freedom to cloſe themſelves again.

Which is an eaſie birth.

What cauſeth eaſineſs of child-birth.

CHAP. XXX.

The cauſe of Abortion or untimely birth.

ABortion or untimely birth is one thing, and effluxion another. They call abortion the ſudden excluſion of the child already formed and alive, before the perfect maturity thereof. But that is called effluxion, which is the falling down of ſeeds mixed together and coagulated but for the ſpace of a few days, only in the forms of membranes or tunicles, congealed blood and of an unſhapen or deformed piece of fleſh; the Midwives of our country call it a falſe branch or bud. This effluxion is the cauſe of great pain and moſt bitter and cruel torment to the woman: leaving behind

What Abortion is.

What Effluxion is.

Women are in more pain by reason of the effluxion than at the true birth.

behind it weakneſs of body far greater than if the child were born at the due time. The cauſes of abortion or untimely birth, whereof the child is called an abortive, are many, as a great ſcouring, a ſtrangury joined with heat and inflammation, ſharp fretting of the guts, a great and continual cough, exceeding vomiting, vehement labour in running, leaping, and dancing, and by a great fall from on high, carrying of a great burthen, riding on a trotting horſe, or in a Coach, by vehement, often and ardent copulation with men, or by a great blow or ſtroke on the belly. For all theſe and ſuch like vehement and inordinate motions diſſolve the ligaments of the womb, and ſo cauſe abortion and untimely birth.

The cauſes of Abortion.

Girding of the belly may cauſe untimely birth.

Alſo whatſoever preſſeth or girdeth in the mothers belly, and therewith alſo the womb that is within it, as are thoſe Ivory or Whale-bone buſks, which women wear on their bodies, thereby to keep down their bellies; by theſe and ſuch like things the child is letted or hindred from growing to his full ſtrength, ſo that by expreſſion, or as it were by compulſion, he is often forced to come forth before the legitimate and lawful time. Thundering, the noiſe of the ſhooting of great Ordnance, the ſound, and vehement noiſe of the ringing of Bells conſtrain women to fall in travail before their time, eſpecially women that are young, whoſe bodies are ſoft, ſlack and tenderer, than thoſe that be of riper years. Long and great faſting, a great flux of blood, eſpecially when the infant is grown ſomewhat great: but if it be but two months old, the danger is not ſo great, becauſe then he needeth not ſo great quantity of nouriſhment; alſo a long diſeaſe of the mother, which conſumeth the blood, cauſeth the child to come 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; becauſe it depraveth the ſtrength, and preſſeth down the child; as likewiſe the uſe of meats that are of an evil juice, which they luſt or long for. But baths becauſe they relax the ligaments of the womb, and hot-houſes, for that the fervent and choaking air is received into the body, provoke the infant to ſtrive to go forth to take the cold air, and ſo cauſe abortion.

How baths and hot houſes cauſe untimely birth.

Hip. aph. 53, & 37 *ſect.* 5.

Hip. aph. 45. *ſect.* 5.

What women ſoever, being indifferently well in their bodies, travail in the ſecond or third month without any manifeſt cauſe, thoſe have the Cotyledons 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 mind, whether they be through anger or fear, may cauſe women to travail before their time; and are accounted to the cauſes of abortions, for that they cauſe great and vehement trouble in the body. Thoſe women that are like to travail before their time, their dugs will wax little; therefore when a woman is great with child, if her dugs ſuddenly wax ſmall and ſlender, it it a ſign that ſhe will travail before her time; the cauſe 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 and ſuccor it withall. Which ſcarcity the infant not long abiding, ſtriveth to go forth to ſeek that abroad which he cannot have within; for among the cauſes which do make the infant to come out of the womb, thoſe are moſt uſually named with *Hippocrates*, the neceſſity of a more large nutriment and air.

Hip. aph. 38. *ſect.* 5.

Women are in more pain at the untimely birth than at the due time of birth.

Therefore if a woman that is with child have one of her dugs ſmall, if ſhe have two children, ſhe is like to travail of one of them before the full and perfect time: ſo that if the right dug be ſmall, it is a man-child, but if it be the left dug, it is a female. Women are in far more pain when they bring forth their children before the time, than if it were at the full and due time; becauſe that whatſoever is contrary to nature, is troubleſome, painful, and alſo oftentimes dangerous. If there be any error committed at the firſt time of child-birth, it is commonly ſeen that it happeneth always after at each time of child-birth. Therefore, to find out the cauſes of that error, you muſt take the counſel of ſome Phyſician, and after his counſel endeavor to amend the ſame. Truly this plaiſter following being applied to the reins doth confirm the womb, and ſtay the infant therein. R. *ladani* ℥ij. *galang.* ℥j. *nucis moſchat. nucis cupreſſi, boli armeni, terræ ſigil. ſanguin. dracon. balauſt. an.* ℥ß. *acatiæ, pſidiorum, hypociſtid. an.* ʒj. *maſtich. myrrhæ, an.* ʒij. *gummi arabic.* ℥j. *terebinthi Venet.* ℥ij. *picis naval.* ℥iß. *ceræ quantum ſufficit, fiat emplaſt. ſecundum artem.* ſpread it for your uſe upon leather. If the part begin to itch, let the plaiſter be taken away and inſtead thereof uſe *unguent. roſat.* or *refrig. Galen.* or this that followeth. R. *olei myrtini, maſtich. cydonior. an.* ℥j. *hypo. boli armen. ſang. dracon. acatiæ, an.* ℥j. *ſant. citrini,* ʒß. *ceræ quant. ſuf.* make thereof an ointment according unto art.

The error of the firſt child-birth continues afterwards.

A plaiſter ſtaying the infant in the womb.

What children are ten or eleven months in the womb.

There are women that bear the child in their womb ten or eleven whole months, and ſuch children have their conformation of much quantity of ſeed: wherefore they will be more big, great and ſtrong, and therefore they require more time to come to their perfection and maturity; for thoſe fruits that are great will not be ſo ſoon ripe as thoſe that are ſmall. But children that are ſmall and little of body, do often come to their perfection and maturity in ſeven or nine months: if all other things are correſpondent in greatneſs and bigneſs of body, it happeneth for the moſt part that the woman with child is not delivered before the ninth moneth be done, or at the leaſtwiſe in the ſame moneth.

A male will be born ſooner than a female.

But a male child will be commonly born at the beginning or a little before the beginning of the ſame month, by reaſon of his engrafted heat which cauſeth maturity and ripeneſs. Furthermore, the infant is ſooner come to maturity and perfection in a hot woman than in a cold, for it is the property of heat to ripen.

CHAP. XXXI.

How to preſerve the infant in the womb, when the mother is dead.

IF all the ſigns of death appear in the woman that lieth in travail, and cannot be delivered, there muſt then be a Surgeon ready and at hand, which may open her body ſo ſoon as ſhe is dead, whereby the infant may be preſerved in ſafety; neither can it be ſuppoſed ſufficient if the mothers mouth and privy parts be held open; for the infant being incloſed in his mothers womb,

womb, and compaſſed with the membranes, cannot take his breath but by contractions and dilations of the artery 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 the body by the mouth or *aſpera arteria* into their own ſubſtance, or into the arteries that are diſperſed throughout the body thereof, by reaſon whereof it cannot ſend it unto the heart by the veiny artery which is called *arteria venalis*: for if the heart want air, there cannot be any in the great artery 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 artery, whereinto the air that is brought from the heart is derived, and floweth in unto theſe little ones of all the body, and likewiſe of the womb. Wherefore it muſt of neceſſity follow that the air is wanting to the cotyledons of the ſecundines, to the artery of the infants navel, the iliack arteries alſo, and therefore unto his heart, and ſo unto his body: for the air being drawn by the mothers lungs, is accuſtomed to come to the infant by this continuation of paſſages. Therefore becauſe death maketh all the motions of the mothers body to ceaſe, it is far better to open her body ſo ſoon as ſhe is dead, beginning the inciſion at the cartilage, *Xiphoides*, or blade, and making it in a form ſemicircular, cutting the skin, muſcles and *peritonæum*, not touching the guts: then the womb being lifted up, muſt firſt be cut, leſt that otherwiſe the infant might perchance be touched or hurt with the knife.

Why it is not ſufficient to preſerve life in the child to hold open the mouth and privy parts of the mother ſo ſoon as ſhe is dead, and the child alive in her body.

How the belly of the woman that dieth in travel muſt be cut open to ſave the child.

You ſhall oftentimes find the child unmovable, as though he were dead; but not becauſe he is dead indeed, but by reaſon that he, being deſtitute of the acceſs of the ſpirits by the death of the mother, hath contracted a great weakneſs; yet you may know whether he be dead indeed or not, by handling the artery of the navel; for it will beat and pant if he be alive, otherwiſe not; but if there be any life yet remaining in him, ſhortly after he hath taken in the air, and is recreated with the acceſs thereof, he will move all his members, and alſo all his whole body. In ſo great a weakneſs or debility of the ſtrength of the child, by cutting the navel-ſtring, it muſt rather be laid cloſe to the region of the belly thereof, that thereby the heat (if there be any jot remaining) may be ſtirred up again. But I cannot ſufficiently marvel at the inſolency of thoſe that affirm that they have ſeen women whoſe bellies and womb have been more than once cut, and the infant taken out, when it could no otherwiſe be gotten forth, and yet notwithſtanding alive; which thing there is no man can perſwade me can be done without the death of the mother, by reaſon of the neceſſary greatneſs of the wound that muſt be made in the muſcles of the belly, 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 blood, which of neceſſity muſt be mortal. And to conclude, when that the wound or inciſion of the womb is cicatrized, it will not permit or ſuffer the womb to be dilated or extended, to receive or bear a new birth. For theſe and ſuch like other cauſes, this kind of cure, as deſperate and dangerous, is not (in mine opinion) to be uſed.

How it may be known whether the infant be 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 be encloſed each in his ſeveral ſecundine: but thoſe that are included in the ſame ſecundine, are ſuppoſed to be 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 days 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 every ſide, though ſmall in quantity, 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 the ſeeds, as ſoon as they are brought into the capacity thereof, and is ſo drawn in unto it on every ſide, that it may come together into one body, not permitting any portion thereof to go into any other region or ſide, ſo that by one time of copulation the ſeed that is mixed together, cannot engender more children than one, which are divided by their ſecundines. And moreover, becauſe there are no ſuch cells in the wombs of women, as are ſuppoſed, or rather known to be in the wombs of beaſts, which therefore bring forth many at one conception or birth. But now if any part of the womans womb doth not apply and adjoin it ſelf cloſely to the conception of the ſeed already received, leſt any thing ſhould be given by nature for no purpoſe, it muſt of neceſſity follow that it muſt be filled with air, which will alter and corrupt the ſeeds; therefore the generation of more than one infant at a time, having every one his ſeveral ſecundine, is on this wiſe. If a woman conceive by copulation with a man as this day, and if that for a few days after the conception, the orifice of the womb be not exactly ſhut, but rather gape a little, and if ſhe do then uſe copulation again, ſo that at both theſe times of copulation there may be 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 than a certain ſecond conception, when the woman already with child, again uſeth copulation with a man, and ſo conceiveth again, according to the judgment of *Hippocrates*. But there may be many cauſes alledged why the womb which did join and cloſe doth open and unlooſe it ſelf again. For there be ſome that ſuppoſe the womb to be open at certain times after the conception, that there may be an iſſue out for certain excremental matters that are contained therein, and therefore that the woman that hath ſo conceived already, and ſhall then uſe copulation with a man again, ſhall alſo conceive again.

A womans womb is not diſtinguiſhed into divers cells.

The reaſon of ſuperfetation.

Lib. de ſuperfetationibus.

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 very deſirous of ſeed or copulation, or elſe being heated or inflamed with the pleaſant motion of the man moving her thereto, doth

doth at length unclose it self to receive the mans seed: for likewise it happeneth many times that the orifice of the stomach being shut after eating, is presently unlooſed again, when other delicate meats are offered to be eaten: even so may the womb unclose it self again at certain seasons, whereof come manifold issues, whose time of birth and also of conception are different. For as *Pliny* 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 having 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 one forth like unto her master, and another like unto his steward: and in another who brought forth one at the due time of child-birth, and another at five months end. And again, in another, who bringing forth her burden on the seventh month, brought forth two more in the months following. But this is a most manifest argument of superfetation, that as many children as are in the womb (unless they be twins of the same sex) so many secundines are there, as I have often seen my self. And it is very likely that if they were conceived in the same moment of time, that they should all be included in one secundine. But when a woman hath more children than two at one burden, it seemeth to be a monstrous thing, because that nature hath given her but two breasts. Although we shall hereafter rehearse many 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 *Mylè*, 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 Latins *Mola*, and of the Greeks *Mylè*. But the tumor called *Mola*, whereof we here intreat, is nothing else but a certain false conception of deformed flesh, round and hard, conceived in the womb as it were rude and unperfect, not distinguished into the members, coming by corrupt, weak, and diseased seed, of the immoderate flux of the terms, as it is defined by *Hippocrates*. This is included in no secundine, but as it were in its own skin.

What a *Mola* is.

Lib. de steril.

Cap. 7. lib. 4. de nat. part.

How the *Mola* is engendred.

There are some that think the *Mola* to be engendred 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 any man saw a woman conceive either a *Mola*, or any other such thing without a copulation of man, as a Hen layeth eggs without a Cock: for the only cause and original of that motion is in the mans seed, and the mans seed doth only minister matter for the generation thereof. Of the same opinion is *Avicen*, who thinketh the *Mola*, to be made by the confluxion of the mans seed that is unfertile, with the womans; when as it, because unfruitful, only puffs up or makes the womans seed to swell as leaven into a greater bigness, but not into any perfect shape or form. Which is also 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 enterprise of conformation already begun, as vanquished or wholly overcome: for the generation of the *Mola* cometh not of a simple heat working upon a clammy and gross humor, as worms are generated; but of both the seeds, by the efficacy of a certain spirit, after a sort prolifical, as may be understood by the membranes wherein the *Mola* is included, by the ligaments whereby many times it is fastned or bound to the true conception or child, engendred or begotten by superfetation; and finally, by the increase, and great and sluggish weight. If all men were not perswaded that the confluxe of a mans seed must of necessity concur to the generation of the *Mola*, it would be no small cloak or cover to women to avoid the shame and reproach of their light behaviour.

CHAP. XXXIV.

How to discern a true conception from a false conception or Mola.

The signs of a *mola* included in the womb.

WHen the *Mola* is included in the womb, the same things appear as in the true and lawful conception. But the more proper signs of the *Mola* are these: there is a certain pricking pain, which at the beginning troubleth the belly as if it were the colick; the belly will swell sooner than it would if it were the true issue, and will be distended with great hardness, and is more difficult and troublesome to carry, because it is contrary to nature, and void of soul or life. Presently after the conception the dugs will swell and puff up, but shortly they fall and become lank and lax; for nature sendeth milk thither in vain, because there is no issue in the womb that may spend the same. The *Mola* will move before the third month, although it be obscurely, but the true conception will not: but this motion of the *Mola* is not of the intellectual soul, but of the faculty 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 child is moved to the right side, to the left side, and to every side gently, but the *Mola*, by reason of its heaviness, 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 daily wax leaner and leaner in all her members, but especially in her legs, although notwithstanding towards night they will swell, so that she will be very slow or heavy in going, the natural

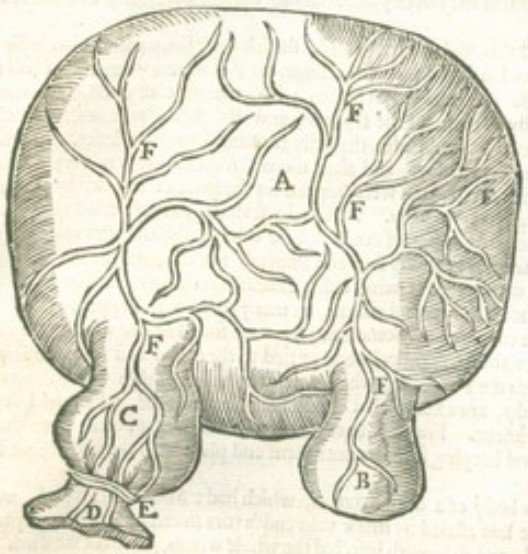
By what faculty the womb moveth.

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 body is.

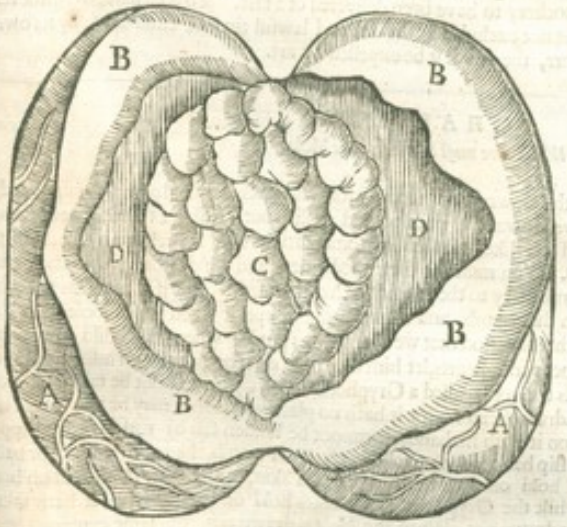
natural heat forſaking the parts remote from the heart by little and little: and moreover, her belly ſwells, by reaſon that the menſtrual matter reſteth about thoſe places, and is not conſumed in the nouriſhment of the *Mola*; ſhe is ſwoln as if ſhe had the dropſie, but that it is harder, and doth not riſe again when it is preſſed with the fingers. The navel doth not ſtand out as it will do when the true iſſue is contained in the womb, neither do the courſes flow as they do ſometimes in the true conception; but ſometimes great fluxes happen, which eaſe the weight of the belly. In many when the *Mola* doth cleave not very faſt, it falleth away within three or four months, being not as yet come unto its juſt bigneſs; and many times it cleaveth unto the ſides of the womb and Cotyledons very firmly, ſo that ſome women carry it in their wombs five or ſix years, and ſome as long as they live.

The external form and deſcription of the forenamed womb.



A *Sheweth the body 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 through the womb.*

The Deſcription of the womb being 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 body, or proper ſubſtance of the womb.*
C *Sheweth the* Mola.
D D *Shew that concavity wherein the* Mola *was contained, or incloſed in the womb.*

The wife of *Guilliam Roger* Pewterer, dwelling in S. *Victors* ſtreet, bore a *Mola* in her womb ſeventeen years, who being of the age of fifty years, died; and I having opened her found the body of her womb to be almoſt looſed, and not tied or bound by its accuſtomed ligatures, but as it were hanging only by the neck, and furthermore cleaving to the Kall adjoining to it, having but only one teſticle, and that on the right ſide, and that ſomewhat broader and looſer than uſual: the horns were not to be ſeen except it were on that ſide, the veſſels were on the neck only, and there very manifeſt and puffed up, it was as big as a mans head. When I had taken it out of her body, I brought it home unto my houſe, that at my leiſure I might find out what was contained in it ſo long; therefore on a certain day, calling together the chief Phyſicians of *Paris*, as *Maſſeleus*, *Alexis*, *Vigor de S. Pont*. *Feure*, *Brovet*, *Violais*, *Grealmus*, *Ravin*, *Mareſcotius*, *Milotus*, *Hautin*, *Riolan*, *Luſſen*; and Surgeons, as *Brun*, *Cointerel*, *Guillemeau*; all theſe being preſent, I opened the womb, A Hiſtory.

and

The deſcription of a *Mola* carried ſeventeen years in the womb.

and I found it in all the body thereof, and in the proper tunicle, ſo ſcirrhous, and ſo hard that I could hardly cut or make a knife to enter it: the body thereof was three fingers thick. In the midſt of the capacity thereof I found a lump of fleſh as big as both my fiſts, like unto a Cows udder, cleaving to the ſides of the womb, but in a certain place, of a very thick, unequal and cloddiſh ſubſtance, with many bodies therein, even as are commonly found in Weins 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 ſcirrhous body, together with the proper ſubſtance of the womb. Moreover, in the middle of the neck of the womb, we found a tumor as big as a Turkies egg, of ſubſtance hard, cartilaginous and bony, 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 novelty of the thing, keep in my cloſet, and before I have deſcribed it.

As long as the woman carried this *Mola* in her womb, ſhe felt moſt ſharp pain in her belly; the region of her belly was marvellous hard, diſtended and large, as if it were a woman that had many children at once in her womb; ſo that many Phyſicians when the time of child-birth was paſt, ſuppoſed that ſwelling of the belly to come of the Dropſie, and aſſaied to cure it as they would the Dropſie; but for all the medicines they could uſe, the belly became never the leſſer. Oftentimes the urine was ſtopped for the ſpace of three days, and then the making of urine was very painful unto her, and many 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 every third month, there came exceeding great fluxes; the matter thereof could not be carried through the capacity of the womb, as we ſaid before, becauſe it was exactly ſhut and ſtopped, but through the veſſels by which Virgins, and alſo certain other women great with child evacuate their menſtrual matter. If the *Mola* be expelled or caſt out in the firſt or ſecond month, as many times it ſo happeneth, it is called of women an unprofitable or falſe conception. Sometimes there are found in one womb two or three moles ſeparated one from another, and ſometimes bound or tied to the ſound and perfect infant: As it happened in the wife of *Valeriola* the Phyſician, which was delivered of a *Mola* which ſhe had carried in her womb twelve months, annexed with a child of four months old, which had deprived the Infant of its room and nutriment. For it is always to be certainly ſuppoſed, that the *Mola*, as a cruel beaſt, by its ſociety, and keeping from its nutriment and place, kills the infant that is joined unto it.

A vain or unprofitable conception.

The *Mola* kills the infant in the womb, when it is faſtned unto it.

I remember once I opened the body of a dead woman, which had a *Mola* in her womb, as big as a Gooſe-egg, which when nature had aſſaied by many vain endeavors to caſt out, remained notwithſtanding, and at length putrified, and therewith infected the whole womb, whereof ſhe died. There be ſome which judging themſelves great with child, do about the ninth or tenth month expel no other thing but ſounding blaſts of wind; whereby the womb ſuddenly falling down, and waxing more ſlender, they are ſaid in a mockery to have been delivered of a fart. To conclude, whatſoever reſembles being with child, if it be not excluded at the due and lawful time of child-birth by its own accord, or by the ſtrength of nature, then muſt it be expelled by art.

CHAP. XXXV.

What cure muſt be uſed to the Mola.

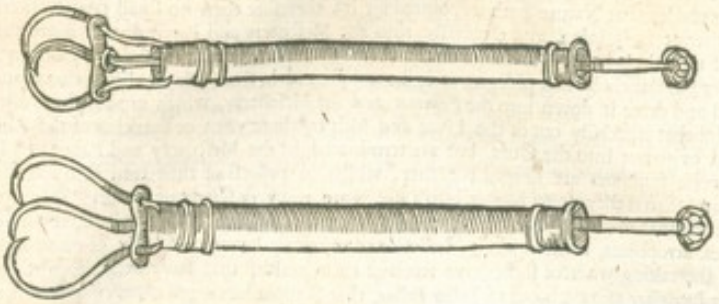
ALL things that provoke the flowers and ſecundines, and exclude the Infant, being dead, are to be preſcribed, given inwardly, put up, and applied outwardly, as Trochiſces of *myrrha*, hermodactyls, and ſuch like, firſt having fomentations that are relaxing and mollifying always applied to the places. You muſt uſe theſe medicines, and phlebotomy, diet and baths then and ſo long as it ſhall ſeem neceſſary to the Phyſician that is preſent. But if it happens that the *Mola* is ſeparated or looſed from the womb, and nature cannot expel it when it is ſo looſed, let the Chirurgion place the woman in that ſituation that we ſaid ſhe was put in, when the child was to be 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 Gryphons Talon; for it cannot be taken hold on otherwiſe, by reaſon of the roundneſs thereof; for it hath no place whereon it may be taken hold of: therefore when one taketh hold on it with his hand, it cannot be holden faſt by reaſon of the ſlipperineſs thereof, but will run and ſlip back into the hollowneſs of the womb, like unto a bowl or ball; but it may be more eaſily taken hold on with the Gryphons Talon, if the belly be preſſed on both ſides that it may remain ſtill while the Gryphons Talon takes hold on it; for when it hath taken good hold on it, it may be eaſily drawn out. When the *Mola* is drawn out, the ſame cure muſt be uſed to the woman, as is uſed to a woman after that ſhe is delivered of child.

Theſe things that provoke the flowers forcibly, do alſo conſume or waſte the *Mola*.

The Chirurgical extraction of the *Mola*.

The

The Figure of an Instrument called a Gryphons Talon, to draw out the Mola *when it is loose in the womb.*



CHAP. XXXVI.

Of Tumors or swellings happening to the Pancreas *or sweet-breads, and the whole Mesentery.*

THe tumors of other places and parts in the belly ought diligently to be 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*, many unskilful Surgeons take them for *Molaes* or scirrhous tumors of the womb, and so go erroneously about to cure them, as shall appear by these Histories following.

An History. *Isabel Rolant* the wife of *John Bony* dwelling in *Paris* in the street *Moncey* near to St. *Gervise* his Church, being threescore years of age, departed this life in the year of our Lord 1578. on the two and twentieth day of *October*, and her body being opened in the presence of Doctor *Milet* the Physician; he, when the Mesentery was taken out of the body, caused it to be carried home to his house, that at his leisure he might find out the cause of this mortal disease, which was always suspected to be in the Mesentery. Therefore on a time calling *Varadeus*, *Breve*, *Chappel*, *Marescotius*, *Arragonius*, *Baillutius*, *Rebortius*, and *Riolan*, all Doctors of Physick, and my self and *Pineus* Surgeons, to his house to see the same: Where we found all the Mesentery and the Pancreas in the Mesentery swollen and puffed up with a marvellous and almost incredible tumor, so that it weighed ten pound and an half, altogether scirrhous on the outside, cleaving on the hinder part onely to the *vertebraes* of the loins; but on the fore-part to the *Peritonæum* being also scirrhous and wholly cartilaginous. Moreover, there were infinite other abscesses in the same Mesentery, every one closed in his several cist, some filled with a honey-like, some filled with a tallow-like, some with an albugineous, and some with a waterish liquor or humour, whereof some also were like unto pap; and to conclude, look how many abscesses there were, so many kinds or differences of matters there were. It was then eight years since that tumour began to grow by little and little without feeling and pain unto such a greatness, because that the Mesentery 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 she had been sound and whole, except that two moneths before she died, she was constrained to keep her bed, because she had a continual Fever, which endured so long as she lived, and also because that the Mesentery, being as it were separated or torn from its roots or seat, did rowl up and down in the belly, not without the feeling of grievous pain: for, as we said before, it did stick but onely to the *vertebraes* of the loins and *Peritonæum*, and nothing at all to the guts and other parts whereunto it is as it were naturally knit or joined.

Apostumes of divers kinds in the *Mesenterium*.

The accidents that come when the *Mesenterium* is separated from the bodies adjoining.

Therefore because the weight and heavinesse thereof depressed the bladder, it caused a great difficulty in her making of water, and also because it rested on the guts, it made it very painful for her to go to stool, so that the excrements would not come down except she took a sharp Clyster to cause them: and as concerning Clysters, they could not be 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 very difficult for her to take breath, by reason that the midriff or *diaphragma* was compressed with the tumor. There were some that did suspect it to be a *Mola*, others thought that it came by reason of the greatness of the tumor. There were some that did suspect it to be a *Mola*, others thought that it came by reason of the dropsie. Assuredly this disease caused 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 many abscesses both within, and without it, and all over it. The milt was scarce free from putrefaction, the Guts and Kall were somewhat blew and spotted, and to be brief, there was nothing found in the lower belly.

The dropsie coming of a Tumor of the *Mesenterium*.

There is the like History to be read, written by *Philip Ingressias*, in his book of Tumors, of a certain Moor that was hanged for theft; for (saith he) when his body was publickly dissected, in the *Mesenterium* were found seventy scrophulous tumors, and so many 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, knotty, clammy, glutinous, liquid and waterish; but the entrails, especially the Liver and the Milt, were found free from all manner of a tainture, because (as the same Author alledgeth) Nature being strong had sent all the evil juice and the corruption of the entrails into the Mesentery: and verily this

Tom. 1. tra. 8. cap. 1.

Moor, so long as he lived, was in good and perfect health. Without doubt the corruption of superfluous humours for the most part is so great (as is noted by *Fernelius*) that it cannot be 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 Mesentery and *Pancreas*, which are as it were the sink of the whole body. In those bodies which through continual and daily gluttony abound with choler, melancholy and phlegm, if it be not purged in time, Nature being strong and lusty, doth repel and drive it down into the *Pancreas* and the Mesentery, 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 Mesentery and *Pancreas*. In these places diverse humours are heaped together, which in process of time turn into a loose and soft tumour, and then if they grow bigger, into a stiff, hard and very scirrhous tumor. Whereof *Fernelius* affirmeth that in those places he hath found the causes of choler, melancholy, fluxes, dysenteries, cachexiaes, atrophiaes, consumptions, tedious and uncertain fevers, and lastly of many hidden diseases, by the taking whereof some have received their health, that have been thought past cure. Moreover *Ingrassias* affirmeth out of *Julius Pollux*, that Scrophulaes may be engendred in the Mesentery, which nothing differs from the mind and opinion of *Galen*, who saith that Scrophulaes are nothing else but indurate and Scirrhous kernels. But the *Mesenterium* with his glanduls being great and many, making the *Pancreas*, doth establish, strengthen and confirm the divisions of the vessels. Also the *scirrhus* of the proper substance of the womb is to be distinguished from the *mola*; for in the bodies of some women that I have opened, I have found the womb annoied with a scirrhous tumor as big as a mans head, in the curing whereof Physicians nothing prevailed, because they supposed it to be a *mola* contained in the capacity of the womb, and not a scirrhous tumor in the body thereof.

Lib. 6. part. mor. cap. 7.

The *Mesenterium* is the sink of the body.

The Scrophulaes in the *Mesenterium*.

The *Scirrhus* of the womb.

CHAP. XXXVII.

Of the cause of barrenness in Men.

How the seed is unfertil.

THere are many causes of barrenness in Men, that is to say, the too hot, cold, dry 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 becometh crude and waterish, because it doth not remain his due and lawful time in the testicles, wherein it should be perfectly wrought and concocted, but is evacuated by wanton copulation. Furthermore, that the seed may be fertile, it must of necessity be copious in quantity but in quality well concocted, moderately thick, clammy, and 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 quantity of seed laudable both in quality and consistence in their testicles, whereby it cometh to pass that they are the less provoked or delighted with venereous actions, and perform the act with less alacrity, so that they yield themselves less prone to conception. Therefore let those that would be Parents of many children use a mediocrity in the use of Venery.

How the cutting of the veins behind the ears maketh men barren.

The Woman may perceive that the mans seed hath some distemperature in it, if when she hath received it into her womb, she feeleth it sharp, hot or cold, if the man be more quick or slow in the act. Many become barren after they have been cut for the Stone, and likewise when they have had a wound behind 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 community which ought of necessity to be between the brain and the testicles, so that when the conduits or passages are stopped, the stones or testicles cannot any more receive, neither matter nor lively spirits from the brain in so great quantity as it was wont, whereof it must of necessity follow, that the seed must be lesser in quantity, and weaker in quality.

Those that have their testicles cut off, or else compressed or contused by violence, cannot beget children, because that either they want that help the testicles should minister in the act of generation, or else because the passage of the seminal matter is intercepted or stopped with a Callus: by reason whereof they cannot yield forth seed, but a certain clammy humour contained in the glanduls called *Prostatæ* (yet with some feeling of delight).

The defaults of the Yard.

Moreover the defects or imperfections of the yard may cause barrenness: as, if it be too short, or if it be so unreasonable great that it renteth the privy parts of a woman, and so causeth a flux of bloud, for then it is so painful to the woman, that she cannot void her seed, for that cannot be excluded without pleasure and delight; also if the shortness of the ligament that is under the Yard doth make it to be crooked, and violate the stiff straitness thereof, so that it cannot be put directly or straightly into the womans privy parts. There be some 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 amongst the causes of barrenness; and you may prove whether the Palsie be in the Yard by dipping the genitals in cold water, for except they do draw themselves 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, but remain in their accustomed laxity and looseness: but in this case the genitals are indued with small sense, the seed cometh out without pleasure or stiffness of the Yard, the stones in touching are cold, and to conclude, those that have their bodies daily waxing lean through a consumption, or that are vexed with an evil habit or disposition,

sition, or with the obstruction of some of the entrails, are barren and unfertil, and likewise those in whom some noble part necessary to life and generation exceedeth the bounds of Nature with some great distemperature; and lastly, those who by any means have their genital parts deformed.

Here I omit those that are with-holden from the act of generation by inchantment, magick, witching and inchanted knots, bands and ligatures; for those causes belong not to Physick, neither may they be 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. *Augustin* hath made mention of them, *Tract.7. in Joan.* Magick bands and enchanted knots.

CHAP. XXXVIII.

Of the barrenness or unfruitfulness of Women.

A Woman may become barren or unfruitful through the obstruction of the passage of the seed, or through straitness and narrowness of the neck of the Womb coming either through the default of the formative faculty, or else afterwards by some mischance, as by an Abscess, Schirrhus, 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 called *Hymen*, when it groweth in the midst or in the bottom of the neck of the womb, hinders the receiving of the mans seed. Also if the womb be over-slippery, or more loose, or over-wide, it maketh the woman to be barren; so doth the suppression of the menstrual fluxes, or the too immoderate flowing of the Courses or Whites: which cometh by the default of the womb, or some entrail, or of the whole body, which consumeth the menstrual matter, and carrieth the seed away with it. The cause why the neck of the womb is narrow. The membrane called *Hymen*.

The cold and moist distemperature of the womb, extinguishes and suffocates the Mans seed, and maketh it that it will not stay or cleave unto the womb, and stay till it be concocted: but the more hot and dry doth corrupt for want of nourishment, for the seeds that are grown either in a marish or sandy ground cannot prosper well: also a *Mola* contained in the womb, the falling down of the womb, the leanness of the womans body, ill humours bred by eating crude and raw fruits, or great, or over-much, 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 be cast out, yet it is deprived of the prolifick power, and of the lively heat and spirits, the orifices or cotyledones 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, because it will not permit the mans seed to enter into the womb. Moreover the fat and fleshy habit of the man or woman hinder generation. For it hindereth them that they cannot join their genitals together: and by how much the more bloud goeth into fat, by so much the less is remaining to be turned into seed and menstrual bloud, which two are the originals and principals of generation. Those women that are speckled in the face, somewhat lean, and pale, are more given to Venery than those that are red and fat. Finally, *Hippocrates* sets down four causes onely why women are barren and unfruitful. The first is, because they cannot receive the mans seed by reason of the fault of the neck of the womb; the second, because when it is received into the womb, they cannot conceive it: the third is, because they cannot nourish it: the fourth, because they are not able to carry or bear it until the due and lawful time of birth. These things are necessary to generation; the Object, Will, Faculty, concourse of the Seeds, and the remaining or abiding thereof in the womb, until the due and appointed natural time. The cause of the flux of Women. *Aph.36.sect.5. Gal. lib.14. De usu Par. cap.9. Arist. in Prob. Sect. decter. Quæst. 3. & 4.*

CHAP. XXXIX.

The signs of a distempered Womb.

THat woman is thought to have her womb too hot, whose Courses come forth sparingly and with pain, and exulcerate by reason of their heat, the superfluous matter of the bloud being dissolved or turned into wind by the power of the heat: whereupon that menstrual bloud that floweth forth is more gross and black. For it is the property of heat, by digesting the thinner substance, to thicken the rest, and by adustion to make it more black. Furthermore, she that hath her genitals itching with the desire of copulation, will soon exclude the seed in copulation, and she 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 coloured. The signs of a hot Womb.

Those that have less desire of copulation, have less delight therein, and their seed is more liquid and watereish, 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 many liquid excrements, which therefore will not hold the seed, but presently after copulation suffereth it to fall out; which will easily cause abortion. The signs of too dry a womb appear in the little quantity of the Courses, in the profusion of a small quantity of seed, by the desire of copulation, whereby it may be made slippery 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 way and that way, and on the contrary with moisture it will close and join together again as it were with glew. The signs of a cold Womb. The signs of a moist Womb. The signs of a dry Womb.

A woman is thought to have all opportunities unto conception when her Courses or Flowers do cease, for then the womb is void of excremental filth, and because it is yet open, it will the more easily A meet time for conception.

easily receive the mans seed, and when it hath received it, it will better retain it in the wrinkles of the Cotyledones yet gaping as it were in rough and unequal places. Yet a woman will easily conceive a little before the time that the Flowers ought to flow: because that the menstrual matter falling at first like dew into the Womb, is very meet and fit to nourish the seed, and not to drive it out again, or to suffocate it.

Those which use copulation when their Courses fall down abundantly, will very hardly or seldom conceive; and if they do conceive, the Child will be weak and diseased, and especially if the womans bloud that flows out be unsound; but if the bloud be good and laudable, the Child will be subject to all plethorick diseases. There are some Women in whom presently after the flux of the Terms, the orifice of the Womb will be closed, so that they must of necessity use copulation with a man when their menstrual flux floweth, if at least they would conceive at all. A Woman may bear children from the age of fourteen until forty or fifty; which time whosoever doth exceed, will bear until threescore years, because the menstrual fluxes are kept, the prolifical faculty is also preserved: therefore many Women have brought forth children at that age; but after that time no woman can bear, as *Aristotle* writeth.

Arist. l.7. de hist. anim. c. 2. & c.5.

Lib.7.cap 14.

Lib.6. cap.12.

Yet *Pliny* saith that *Cornelia* (who was of the house of the *Scipiones*) being in the sixty second year of her age, bare *Voluseius Saturninus*, who was Consul; *Valescus de Tarenta* also affirmeth that he saw a Woman that bare a child on the sixty second year of her age, having born before on the sixtieth and sixty first year. Therefore it is to be supposed that by reason of the variety of the air, region, diet and temperament, the menstrual flux and procreative faculty ceaseth in some sooner, in some later; which variety taketh place also in men. For in them, although the seed be genitable for the most part in the second seventh year, yet it is unfruitful until the third seventh year. And whereas most men beget Children until they be threescore years old, which time if they pass, they beget till seventy; yet there are some known that have begot children until the eightieth year. Moreover, *Pliny* writeth that *Massinissa* the King begot a Son when he was fourscore and six years of age, and also *Cato* the Censor after that he was fourscore.

Lib.7. de hist. anim.c.1.&2.6

Lib.7.cap.14.

CHAP. XL.

Of the falling down, or perversion, or turning of the Womb.

What is the falling down of the Womb.

The causes.

THe Womb is said to fall down and be perverted, when it is moved out of its proper and natural place; as when the bands and ligatures thereof being loosed and relaxed, it falleth down unto one side or other, or into its own neck, or else passeth further, so that it comes out at the neck, and a great portion thereof appears without the privy parts. Therefore what things soever resolve, relax, or burst the ligaments or bands whereby the Womb is tied, are supposed to be the causes of this accident. It sometimes happens by vehement labour or travel in Child-birth, when the Womb with violence excluding the issue and the secundines, also follows and falls down, turning the innerside thereof outward. And sometimes the foolish rashness of the Midwife when she draweth away the Womb with the Infant, or with the secundine cleaving fast thereunto, and so drawing it down and turning the innerside outward. Furthermore, a heavy bearing of the Womb, the bearing of the carriage of a great burthen, holding or stretching of the hands or body upwards in the time of greatness with child, a fall, contusion, shaking or jogging by riding either in a Waggon or Coach, or on Horse-back, or leaping or dancing, the falling down of a more large and abundant humour, great griping, a strong and continual cough, a *Tenesmus* or often desire to go to stool, yet not voiding any thing, sneezing, a manifold and great birth, difficult bearing of the Womb, an asthmatical and orthopnoical difficulty of breathing, whatsoever doth weightily press down the *Diaphragma* or Midriff, or the muscles of the *Epigastrium*, the taking of cold air in the time of travel with child, or in the flowing of the menstrual flux, sitting on a cold marble stone, or any other such like cold things are thought oftentimes to be the occasion of these accidents, because they may bring the Womb out of its place.

Arist. lib.7. de histor. anim. cap.2.

It falls down in many (saith *Aristotle*) by reason of the desire of copulation that they have, either by reason of the lustiness of their youth, or else because they have abstained a long time from it.

The signs.

You may know that the Womb is fallen down by the pain of those parts wherein it is fallen, that is to say by the entrails, loins, *os sacrum*, and by a tractable tumor at the neck of the Womb, and often with a visible hanging out, of diverse greatness, according to the quantity that is fallen down. It

The prognostications.

is seen sometimes like unto a piece of red flesh, hanging out at the neck of the Womb, of the bigness and form of a Goose-egg; if the woman stand upright, she feeleth the weight to lie on her privy parts; but if she sit or lie, then she perceiveth it on her back, or go to the stool, the straight gut called *intestinum rectum* will be prest or loaden as if it were with a burthen; if she lie on her belly, then her urin will be stopped, so that she shall fear to use copulation with a man.

When the Womb is newly relaxed in a young woman, it may be soon cured; but if it hath been long down in an old woman, it is not to be helped. If the Palsie of the ligaments thereof have occasioned the falling, it scarce admits of cure; but if it falls down by means of putrefaction, it cannot possibly be cured. If a great quantity thereof hang out between the thighs, it can hardly be cured; but it is corrupted by taking the air, and by the falling down of the urin and filth, and by the motions of the thighs in going it is ulcerated, and so putrefies.

An History.

I remember that once I cured a young Woman who had her Womb hanging out at her privy parts as big as an Egg, and I did so well perform and perfect the Cure thereof, that afterwards she conceived, and bare children many times, and her Womb never fell down.

CHAP.

CHAP. XLI.

The cure of the falling down of the Womb.

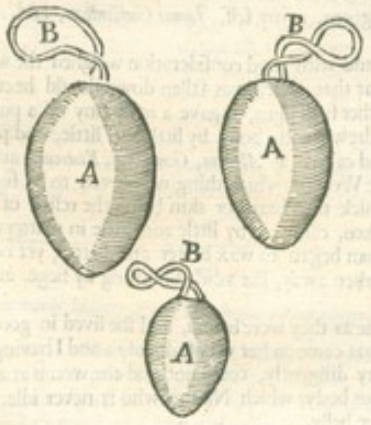
BY this word, falling down of the Womb, we underſtand every motion of the Womb out of its place or ſeat: therefore if the Womb aſcend upwards, we muſt uſe the ſame medicins as in ſtrangulation of the Womb. If it be turned towards either ſide, it muſt be reſtored and drawn back to its right place, by applying and uſing cupping-glaſſes. But if it deſcend and fall down into its own neck, but yet not in great quantity, the woman muſt be placed ſo that her buttocks may be very high, and her legs acroſs; then Cupping-glaſſes muſt be applied to her navel and *Hypogaſtrium*, and when the Womb is brought into its place, injections that bind and dry ſtrongly muſt be injected into the neck of the Womb, ſtinking fumigations muſt be uſed unto the privy parts, and ſweet things uſed to the mouth and noſe. But if the womb hang down in great quantity between the thighs, it muſt be cured by placing the woman after another ſort, and by uſing other kind of Medicins. Firſt of all ſhe muſt be ſo laid on her back, her buttocks and thighs ſo lifted up, and her legs ſo drawn back as when the child or fecundine are to be 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 Greaſe, 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.

Remedies for the aſcenſion of the Womb.

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 be wiped with a ſoft and clean cloth, leſt that by the ſlipperineſs thereof the womb ſhould fall down again; the genitals muſt be fomented with an aſtringent decoction, made with Pomgranate Pills, Cypreſs Nuts, Galls, Roch Allum, Horſe-tail, Sumach, Berberies, boiled in the water wherein Smiths quench their Irons; of thoſe materials make a powder, wherewith let thoſe places be ſprinkled: let a Peſſary of a competent bigneſs be put in at the neck of the Womb, but let it be eight or nine fingers in length, according to the proportion of the grieved Patients body. Let them be made either with Lattin, or of Cork covered with Wax, of an oval form, having a thread at one end, whereby they may be drawn back again as need requires.

The forms of oval Peſſaries.



A *Shews the body of the Peſſary.*
B *Sheweth the thread wherewith it muſt be tied to the thigh.*

When all this is done, let the ſick woman keep her ſelf quiet in her bed, with her buttocks lying very high, and her legs acroſs, for the ſpace of eight or ten days: in the mean while the application of Cupping-glaſſes will ſtay the Womb in the right place and ſeat, after it is reſtored thereunto: but if ſhe hath taken any hurt by cold air, let the privy parts be fomented with a diſcuſſing and heating fomentation, on this wiſe: ℞ *Fol. alth. ſalv. lavend. roſmar. artemiſ. flor. chamæm. melilot. an.* m β. *ſem. aniſ. fœnugr. an.* ℥ j. let them be all well boiled in water and wine, and make thereof a decoction for your uſe. Give her alſo Clyſters, that when the Guts are emptied of the excrements, the Womb may the better be received in the void and empty capacity of the belly: for this reaſon the bladder is alſo to be emptied, for otherwiſe it were dangerous leſt that the Womb lying between them, both being full, ſhould be kept down, and cannot be put up into its own proper place by reaſon thereof. Alſo Vomiting is ſuppoſed to be a ſingular remedy to draw up the Womb that is fallen down: furthermore alſo it purgeth out the phlegm wich did moiſten and relax the ligaments of the womb, for as the Womb in time of copulation at the beginning of the conception it moved downwards to meet the ſeed, ſo the Stomach, even of its own accord, is lifted upwards when it is provoked by the injury of any thing that is contrary unto it, to caſt it out with greater violence; but when it is ſo raiſed up, it draws up together therewith the *Peritonæum*, the Womb and alſo the body or parts annexed unto it. If it cannot be reſtored unto its place by theſe preſcribed remedies, and that it be 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

A diſcuſſing and heating fomentation.

How vomiting is profitable to the falling down of the Womb.

The cutting away of the Womb when it is putrefied.

the Womb according to Art; but firſt it ſhould be tied, and as much as is neceſſary muſt be cut off, and the reſt ſeared with a Cautery. There are ſome women that have had almoſt all their womb cut off, without any danger of their life, as *Paulus* teſtifieth.

Lib. 6.

Epiſt. 39. lib. 2. Epiſt. med. *John Langius* Phyſician to the Count Palatine writeth, that *Carpus* the Chirurgeon took out the womb of a Woman of *Bononia*, he being preſent, and yet the woman lived and was very well after it.

Trac. de mir. and morb. caus. *Antonius Benevenius* Phyſician of *Florence* writeth, that he, called by *Ugolin* the Phyſician to the cure of a woman whoſe womb was corrupted and fell away from her by pieces, and yet ſhe lived ten years after it.

An Hiſtory. There was a certain woman, being ſound of body, of good repute, and above the age of thirty years, in whom, ſhortly after ſhe had been married the ſecond time, which was in *Anno* 1571. having no child 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 ſenſe or feeling of a weight or heavineſs, being ſo troubleſom unto her by reaſon that it was painful, and alſo for that it ſtopped her urin, that ſhe was conſtrained to diſcloſe her miſchance to *Chriſtopher Mombey* a Surgeon, her neighbour dwelling in the Suburbs of S. *Germans*; who having ſeen the tumor or ſwelling in her groin, aſſwaged the pain with mollifying and anodyne Fomentations and Cataplaſms; but preſently after he had done this, he found on the inner ſide of her 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, ſomewhat red, yellow, and pale, running a long time. Yet for all this the feeling of the heavineſs or weight was nothing diminiſhed, but did rather increaſe daily, ſo that from the Year of our Lord 1573. ſhe could not turn her ſelf being in her bed on this or that ſide, unleſs ſhe laid her hand on her belly to bear and eaſe her ſelf of the weight; and alſo ſhe ſaid when ſhe turned her ſelf, ſhe ſeemed to feel a thing like a Bowl or Rowl in her belly unto the ſide whereunto ſhe turned her ſelf, neither could ſhe go to ſtool, or avoid her excrements ſtanding or ſitting, unleſs ſhe lift up that weight with her hands towards her ſtomach or midriff: when ſhe was about to go, ſhe could ſcarce ſet forwards her feet, as if there had ſomething hanged between her thighs, that did hinder her going. At certain ſeaſons that rotten apoſtume would open or uncloſe of it ſelf, and flow and run with its wonted ſanious matter, but then ſhe was grievouſly vexed with pain of the head, and all her members, ſwouning, loathing, vomiting, and almoſt choaking, ſo that by the perſuaſion of a fooliſh woman ſhe was induced and contented to take *Antimonium*, the working and the ſtrength thereof was ſo great and violent, that after many vomits, with many fretings of the guts, and watery dejections of ſtools, ſhe thought her fundament fell down, but being certified by a woman that was a familiar friend of hers, unto whom ſhe ſhewed her ſelf, that there was nothing fallen down at or from her fundament, but it was from her womb, ſhe called in the Year of our Lord, 1575. Surgeons, as my ſelf, *James Guillemeau*, and *Antony Vieux*, that we might help her in extremity.

Antimonium taken in a potion doth cauſe the womb to fall down.

The ſigns of the ſubſtance of the Womb drawn out. When we had diligently and with good conſideration weighed the whole eſtate of her diſeaſe, we agreed with one conſent, that that which was fallen down ſhould be cut away, becauſe that by the black colour, ſtinking, and other ſuch ſigns, it gave a teſtimony of a putrefied and corrupted thing. Therefore for two days we drew out the body by little and little, and piece-meal, which ſeemed unto the Phyſicians that we had called, as *Alexius*, *Gaudinus*, *Fevreus*, and *Violaneus*, and alſo to our ſelves, to be the body of the Womb; which thing we proved to be ſo, becauſe one of the teſticles came out whole, and alſo a thick membrane or skin being the relick of the *Mola*, which being ſuppurated, and the abſceſs broken, came out by little and little in matter; after that all this body was ſo drawn away, the ſick woman began to wax better and better, yet notwithſtanding for the ſpace of nine days before it was taken away, ſhe voided nothing by ſiege, and her urin alſo was ſtopped for the ſpace of four days.

After this all things became as they were before, and ſhe lived in good health three Moneths after, and then died of a Pleuriſie that came on her very ſuddenly; and I having opened her body, obſerving and marking every thing very diligently, could not find the womb at all, but in ſtead thereof there was a certain hard and callous body, which Nature, who is never idle, had framed in ſtead thereof, or to fill the hollowneſs of the belly.

CHAP. XLII.

Of the Tunicle or Membrane called Hymen.

Whether there be a membrane called *Hymen*. IN ſome Virgins or Maidens in the orifice of the neck of the womb, there is found a certain Tunicle or Membrane, called of ancient Writers *Hymen*, which prohibiteth the copulation of a man, and cauſeth a woman to be barren; this Tunicle is ſuppoſed by many, and they not of the common ſort onely, but alſo learned Phyſicians, to be as it were, the encloſure of the Virginity or Maidenhead. But I could never find it in any, ſeeking of all ages from three to twelve, of all that I had under my hands in the Hoſpital of *Paris*.

An Hiſtory. Yet once I ſaw in a Virgin of ſeventeen years, whom her mother had contracted to a man, and ſhe knew nevertheleſs there was ſomething in her privy parts that hindred her from bearing of children, who deſired me to ſee her, and I found a very thin nervous membrane a little beneath the *Nymphæ*, near unto the orifice of the neck of the womb, in the midſt there was a very little hole whereout the Terms might flow; I ſeeing the thickneſs thereof, cut it in ſunder with my Sciſſars, and told her Mother what ſhe ſhould do afterwards: and truly ſhe married ſhortly after and bore children. *Realdus Columbus* is of my opinion, and ſaith that this is ſeen very ſeldom; for theſe are his words, Under the *Nymphæ* in many, 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 be put into the orifice of

lib. 11. cap. 16.

of the Womb, for it is very thick; above towards the bladder it hath an hole by which the Courses flow out. And he also addeth, that he observed it in two young Virgins, and in one elder Maid.

Avicen writes, that in Virgins in the neck of the Womb there are Tunicles composed of Veins and Ligaments very little, rising from each part of the neck thereof, which at the first time of copulation are wont to be broken, and the bloud run out. *Almansor* writeth, that in Virgins the passage of the neck of the Womb is very wrinkled, or narrow and strait, and those wrinkles to be woven or staid together with many little veins and arteries, which are broken at the first time of copulation. *Lib. 3. fen. 21. Tract. 1. cap. 1.*

These are the judgments of Physicians 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 errour. For that Midwives can speak nothing certainly of this membrane, may be proved by this, because that one saith that the situation thereof is in the very entrance of the privy parts, others say it is in the midst of the neck of the Womb, and others say it is within at the inner orifice thereof, and some are of an opinion, that they say or suppose that it cannot be seen or perceived before the first birth. But truly of a thing so rare, and which is contrary to Nature, there cannot be any thing spoken for certainty. Therefore the bloud that cometh out at the first time of copulation, comes not always 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 bloud, especially if the mans Yard be answerable to the neck of the womb. Whereby it appears evidently how greatly the inhabitants of *Fez*, the Metropolitan City of *Mauritania* are deceived; for *Leo* the *African* writeth, that it is the custom amongst them, that so soon as the married man and his spouse are returned home to their house 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 some old or grave Matron standeth waiting before the Chamber to receive a bloudy linnen cloth the new married husband is to deliver her there; which when she hath received, she brings it into the midst of all the company of guests, as a fresh spoil and testimony of the married wifes Virginity, and then for joy thereof they all fall to banquetting solemnly. But if through evil fortune it happeneth that in this time of copulation the spouse bleedeth not in the privy parts, she is restored again unto her Parents, which is a very great reproach unto them, and all the Guests depart home sad, heavy, and without dinner. *Lib. 3.*

The trifles of Midwives about the membrane called *Hymen*.

What Virgins at the first time of copulation do not bleed at their privy parts.

Moreover there are some, that having learned the most filthy and infamous Arts of Baudery, prostitute common Harlots, make gain thereof, making men that are naughtily given to believe that they are pure Virgins, making them to think that the act of generation is very painful and grievous unto them, as if they had never used it before, although they are very expert therein indeed; for they do cause 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 gall of Beasts filled full of bloud, and so deceive the ignorant and young Letcher by the defraud and deceit of their evil Arts, and in time of copulation they mix sighs with groans, and woman-like cryings, and Crocodiles tears, that they may seem to be Virgins, and never to have dealt with man before.

The filthy deceit of Bauds and Harlots.

CHAP. XLIII.

A memorable History of the Membrane called Hymen.

John Wierus writeth that there was a Maid at *Camburge*, who in the midst of the neck of the womb had a thick and strong membrane growing overthwart, so that when the monethly Terms come out, it would not permit them, so that thereby the menstrual matter was stopped and flowed back again, which caused a great tumor and distention in the belly, with great torment, as if she had been in travel with child: the Midwives being called, and having seen and considered all that had been done, and did appear, did all with one voice affirm, that she sustained the pains of child-birth, although that the Maid her self denied that she ever dealt with man. Therefore then this foresaid Author was called, who when the Midwives were void of counsel, might help this wretched Maid, having already had her urin stopt now three whole weeks, and perplexed with great watchings, loss of appetite, and loathing: and when he had seen the grieved place, and marked the orifice of the neck of the womb, he saw it stopped with a thick membrane; he 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 cause of her grievous and tormenting pain. And therefore he called a Chirurgeon presently, and willed him to divide the membrane that was in the midst, that did stop the flux of bloud; which being done, there came forth as much black, congealed and putrefied bloud as weighed some eight pounds. In three days after she was well and void of all disease and pain. I have thought it good to set down this example here, because it is worthy to be noted, and profitable to be imitated, as the like occasion shall happen. *Lib. de Prest. damon. cap. 38.*

CHAP.

CHAP. XLIV.

Of the ſtrangulation of the Womb.

What is the ſtrangulation of the Womb.

THe ſtrangulation of the Womb, or that which cometh from the Womb, is an interception or ſtopping of the liberty in breathing or taking wind, becauſe that the Womb, ſwollen or puffed up by reaſon of the acceſs of groſs vapours and humours that are contained therein, and alſo ſnatched as it were by a convulſive motion, by reaſon that the veſſels and ligaments diſtended with fulneſs, are ſo carried upwards againſt the midriff and parts of the breſt, that it maketh the breath to be ſhort, and often as if a thing lay upon the breſt and preſſed it.

Why the womb ſwelleth.

Moreover the Womb ſwelleth, becauſe 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 ſome other humour, tumor, abſceſs, rotten apoſtume, or ſome ill juice, putrefying or getting, or ingendring an ill quality, and reſolved into groſs vapours. Theſe, as they affect ſundry or divers places, infer divers or ſundry accidents, as rumbling and noiſe in the belly; if it be in the guts, deſire to vomit, after (with ſeldom vomiting) cometh wearineſs and loathing of meat, if it trouble the Stomach. Choaking with ſtrangulation, if it aſſail the breſt and throat; ſwooning, if it vex the heart; madneſs, or elſe that which is contrary thereto, ſound ſleep or drowſineſs, if it grieve the brain: all which oftentimes prove as malign as the biting of a mad dog, or equal the ſtingings or bitings of venomous beaſts.

The accidents that come of the ſtrangling of the womb.

Why the ſtrangulation that cometh of the corruption of the ſeed, is more dangerous than that that comes of the corruption of the blood.

It hath been obſerved that more grievous ſymptoms have proceeded from the corruption of the Seed than of the menſtrual bloud. For by how much every thing is more perfect and noble, while it is contained within the bounds of the integrity of its own nature, by ſo much it is the more grievous and perilous, when by corruption it hath once tranſgreſſed the laws thereof. But this kind of accident doth very ſeldom grieve thoſe women which have their menſtrual flux well and orderly, and do uſe copulation familiarly; but very often thoſe women that have not their menſtrual flux as they ſhould, and do want and are deſtitute of husbands, eſpecially if they be great eaters, and lead a ſolitary 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 breadth, ſo much is wanting in their length: and therefore it happeneth that the Womb, being removed out of its ſeat, doth one while fall to the right ſide towards the liver, ſometimes to the left towards the milt, ſometimes upwards unto the midriff and ſtomach, ſometimes downwards, and ſo forwards unto the bladder, whereof cometh an Iſchury and Strangury; or backwards, whereof cometh oppreſſion of the ſtraight Gut, and ſuppreſſion of the excrements, and the *Teneſmus*.

The cauſe of the divers turnings of the womb into divers parts of the body.

The womb is not ſo greatly moved by an accident, but by it ſelf.

But although we acknowledge the womb to decline to thoſe parts which we 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, being diſtended with fulneſs, but alſo of it ſelf, as when it is forced or provoked through the grief of ſomething contrary to Nature that is contained therein: it waudreth ſometimes unto one ſide, and ſometimes unto another part with a plain and evident natural motion, like unto the ſtomach which embraceth any thing that is gentle and mild, but avoideth any thing that is offenſive and hurtful; yet we deny that ſo great accidents may be ſtirred up by the falling of it alone unto this or that ſide, for then it might happen that women that are great with child, whoſe wombs are ſo diſtended by reaſon that the child is great, that it doth preſs the midriff, might be troubled with a ſtrangulation like unto this; but much rather by a venomous humour breathing out a malign and groſs vapour, not only by the veins and arteries, but alſo by the pores that are inviſible, which pollutes the faculties of the parts which it toucheth with its venomous malignity and infection, and intercepts the functions thereof. Neither doth the variety of the parts receiving onely, but alſo of the matter received, cauſe variety of accidents.

Whereof come ſuch divers accidents of ſtrangulation of the womb.

The cauſe of ſleepineſs in the ſtrangulation of the womb.

For ſome accidents come by ſuppreſſion of the terms, others come by corruption of the Seed; but if the matter be cold, it bringeth a drowſineſs, being lifted up unto the brain, whereby the woman ſinketh down as if ſhe were aſtoniſhed, and lieth without motion and ſenſe or feeling, and the beating of the arteries, and the breathing are ſo ſmall, that ſometimes it is thought they are not at all, but that the woman is altogether dead. If it be more groſs, it inferreth a convulſion; if it participate of the nature of a groſs melancholick humour, it bringeth ſuch heavineſs, fear and ſorrowfulneſs, that the party that is vexed therewith ſhall think that ſhe ſhall die preſently, and cannot be brought out of her mind by any means or reaſon; if of a cholerick humour, it cauſeth the madneſs called *Furor Uterinus*, and ſuch a pratling that they ſpeak all things that are to be 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, than that this diſeaſe taketh the Patient ſometimes with laughing, and ſometimes with weeping; for ſome at the firſt will weep and then laugh in the ſame diſeaſe and ſtate thereof.

The cauſe of drowſie madneſs.

An Hiſtory.

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 aſcenſion of the Womb is diligently to be diſtinguiſhed from the ſtrangulation thereof; for the accidents of the aſcenſion and of the ſtrangulation are not one, but the woman is onely oppreſſed with a certain pain of the heart, difficulty of breathing or ſwooning, but yet without fear, without raving or idle talking, or any other greater accident.

The aſcenſion of the womb is to be diſtinguiſhed from the ſtrangulation.

Therefore oftentimes contrary cauſes infer the aſcenſion: that is, overmuch drineſs of the Womb, labouring through the defect of moiſture, whereby it is forced after too violent and immoderate eva-

evacuations of the Flowers, and in Child-bed, and such like, and laborious and painful travel in Child-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 happily it may draw some moisture there-hence unto it. I omit that the Womb may be brought unto its place upwards by often smelling to aromatick things, yet in the mean while it infers not the strangulation that we described before.

CHAP. XLV.

The signs of imminent strangulation of the Womb.

BEfore that these fore-named accidents come, the Woman thinks that a certain painful thing ariseth from her Womb unto the orifice of the stomach and heart, and she thinketh her self to be oppressed and choaked, she complaineth her self to be in great pain, and that a certain lump or heavy thing climbs up from the lower parts unto her throat, and stoppeth her wind, her heart burneth and panteth. And in many 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 be 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 vapour ascendeth from the Womb as we said before: but when the fit is at hand, their faces are pale on a sudden, their understanding is darkened, they become slow and weak in the legs, with unableness to stand. Hereof cometh 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 ascension as the vapour thereof.

CHAP. XLVI.

How to know whether the Woman be dead in the strangulation of the Womb, or not.

I Have thought it meet (because many Women, not onely in ancient Times, but in our own and our Fathers memory have been so taken with this kind of symptom, 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 proved whether she be alive or dead, by laying or holding a clear and smooth Looking-glass before her mouth and nostrils. For if the breath, although it be never so obscurely, the thin vapour that cometh out, will stain or make the Glass dusky. Also a fine downish feather taken from under the wing of any Bird, or else a fine flock being held before the mouth, will by the trembling or shaking motion thereof, shew that there is some breath, and therefore life remaining in the body. But you may prove most certainly whether there be any spark of life remaining in the body, by blowing some sneezing powders of Pellitory of *Spain*, and Hellebore in the nostrils. But though there no breath appear, yet must you not judge the woman for dead, for the small vital heat, by which being drawn into the heart, she yet liveth, is contented with transpiration onely, and requires not much attraction, which is performed by the contraction and dilatation of the Brest and Lungs unto the preservation of it self. For so Flies, Gnats, Pismires, and such like, because they are of a cold temperature, live unmoveably inclosed in the caves of the earth, no token of breathing appearing in them, because there is a little heat left in them, which may be conserved by the office of the arteries and heart, that is to say, by perspiration, without the motion of the brest, because the greatest use of respiration is, that the inward heat may be 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 Anatomical administration, that was almost decaied and neglected.

Women living taken for dead.

How Women that have the suffocation of the Womb, live onely by transpiration without breathing.

How Flies, Gnats, and Pismires do live all the Winter without breathing.

For he being called in *Spain* to open the body of a Noble-woman which was supposed dead through strangulation of the Womb, behold at the second impression of the Incision-knife, she began suddenly to come to her self, and by the moving of her members and body, which was supposed to be altogether dead, and with crying, to shew manifest signs that there was some life remaining in her. Which thing struck such an admiration and horrour into the hearts of all her friends that were present, that they accounted the Physician, being 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 eyes presently: wherefore he thought there was no better way for him, if he would live safe, then to forsake the Countrey. But neither could he so also avoid the horrible prick and inward wound of his Conscience (from whose judgment no offender can be absolved) for his inconsiderate dealing, but within few days after being consumed with sorrow, he died, to the great loss of the Commonwealth, and the Art of Physick.

An History.

CHAP. XLVII.

How to know whether the strangulation of the Womb comes of the suppression of the Flowers, or the corruption of the Seed.

THere are two chief causes especially, as most frequently happening, of the strangulation of the Womb: but when it proceedeth from the corruption of the Seeds all the accidents are more grievous and violent: difficulty of breathing goes before, and shortly after comes deprivation thereof; the whole habit of the body seemeth more cold than a stone: the Woman is a Widow, or else hath great store or abundance of Seed, and hath been used to the company of a man, by the

The signs of suffocation of the Womb coming of corrupt seed.

the abſence whereof ſhe was before wont to be pained with heavineſs of the head, to loath her meat, and to be troubled with ſadneſs or fear, but chiefly with melancholy. Moreover, when ſhe hath ſatisfied, and every way fulfilled her luſt, and then preſently on a ſudden begins to contain her ſelf; it is very likely that ſhe is ſuffocated by the ſuppreſſion of the Flowers, which formerly had them well and ſufficiently, which formerly had been fed with hot, moiſt and many meats, therefore engendring much bloud, which fitteth much, which is grieved with ſome weight and ſwelling in the region of the belly, with pain in the ſtomach, and a deſire to vomit, and with ſuch other accidents as come by the ſuppreſſion of the Flowers. Thoſe who are freed from the fit of the ſuffocation of the womb, either by Nature or by Art, in a ſhort time their colour cometh into their faces by little and little, and the whole body beginneth to wax ſtrong, and the teeth, that were ſet and cloſed faſt together, begin (the jaws being looſed) to open and uncloſe again; and laſtly, ſome moiſture floweth from the ſecret parts with a certain tickling pleaſure; but in ſome women, as in thoſe eſpecially in whom the neck of the womb is tickled with the Midwifes finger, in ſtead of that moiſture comes thick and groſs ſeed, which moiſture or ſeed when it is fallen, the womb being before as it were raging, is reſtored unto its 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 ſymptoms as women have, becauſe Mans ſeed is not ſo cold and moiſt, but far more perfect and better digeſted, and therefore more meet to reſiſt putrefaction, and whileſt it is brought or drawn together by little and little, it is diſſipated by great and violent exerciſe.

The ſigns when it comes 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 diſeaſe, it therefore requireth a preſent and ſpeedy remedy; for if it be neglected, it many times cauſeth preſent death. Therefore when this malady cometh, the ſick woman muſt preſently be placed on her back, having her breſt and ſtomach looſe, and all her cloaths and garments ſlack and looſe about her, whereby ſhe may take breath the more eaſily; and ſhe 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 provoking or cauſing pain in the lower parts, the Patient may not onely be brought to her ſelf again, but alſo that the ſharp and malign vapour aſcending upwards, may be drawn downwards: the legs and arms muſt be bound and tied with painful ligatures, all the body muſt be rubbed over with rough linnen cloths beſprinkled with Salt and Vinegar, until it be very ſore and red; and let this peſſary following be put into the womb. ℞ *Succi mercur. artemiſ. an.* ʒ ij. *in quibus diſſolve pul. boned.* ʒ iij. *pul. radic. cunilæ camp. galang. minor. an.* ʒ j. make thereof a peſſary. Then let the ſoals of her feet be anointed with Oil of Bays, or with ſome ſuch like Oil; let a great cupping-glaſs with a great flame be applied to the belly below the navel, to the inner part of the thigh, and to the groin, whereby both the matter that climbs upwards, and alſo the womb it ſelf running the ſame way, may be brought downwards or drawn back. There may be made a fumigation of Spices to be received up into the womb, which that it may the eaſier be done, the womb may be held open by putting in the Inſtrument here following deſcribed, into the neck thereof. Let it be made of gold, ſilver, or lattin, into the form of a peſſary; at the one end thereof, that is to ſay, that end which goeth up into the neck of the womb, let there be made many holes on each ſide, but at the lower end let it be 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 be made faſt into a Swathe or Girdle tied about the Patients belly.

The pulling of the hairs of the lower parts are profitable both for this malady and for the cauſe of the ſame.

A Peſſary.

The matter of ſweet fumigations.

By what power ſweet Fumigations do reſtore the womb unto its own nature and place.

Stinking ſmels to be applied to the noſtrils.

Avicens ſecret for ſuffocation of the Womb.

The matter and ingredients of ſweet and aromatick fumigations, are Cinamon, Calam. Aromat. Lig. Aloes, Ladanum, Benzoin, Thyme, Pepper, Cloves, Lavander, Calamint, Mugwort, Penni-royal, *Alepta moſchat.* Nutmegs, Musk, Amber, Squinant, and ſuch like, which for their ſweet ſmell and ſympathy, allure or intice the womb downwards, by their heat conſume and digeſt the thick vapours and putrefied ill juice. Contrariwiſe, let the noſtrils be perfumed with fetid and rank ſmells, and let theſe be 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 Birds Feathers, eſpecially of Partridges or Woodcocks, of Mans hair, or Goats hair, of old Leather, of Horſe-hoofs, and ſuch like things burned, whoſe noiſom or offenſive ſavour the womb avoiding, doth return unto its own place or ſeat again.

Moreover it ſhall be very neceſſary to procure vomit by thruſting a Gooſe-feather down into the throat, or elſe the hairs of the Patients own head. Shortly after ſhe muſt uſe a potion of fifteen grains of black Pepper bruiſed and diſſolved in *hydromel*, or water and honey mixed together, or in ſome ſtrong Wine, which remedy *Avicen* holdeth for a ſecret.

Caſtoreum drunken.

Expreſſions into the womb

Alſo in ſtead thereof three hours before meat ʒ ß of Treacle diſſolved in ʒ j. of the water of Wormwood may be given her: alſo it is thought that one drop of the oil of Jeat dropped on the tongue, is a very profitable remedy. There be ſome 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, being firſt diſſolved in *Aqua vitæ*, and in the mean time to drop two drops of oil of Sage, or ſome ſuch Chymical Oil, into the ears. If ſhe be drowſie or ſleepy, ſhe muſt be awaked or kept waking with ſneezing powders of white Hellebore and Pellitory.

The matter of Peſſaries.

It is alſo requiſite to inject Clyſters both into the fundament and ſecret parts, which muſt be made of the decoction of things that diſcuſs wind, as of Calamint, Mugwort, Lavander, Penni-royal, Camomil, Melilot, and ſuch like; and let peſſaries or ſuppoſitories be made of Ladanum, Ginger, *Gallia moſchat.* Treacle, Mithridate, Civet, and Musk, of the oil of Cloves, Anniſeeds, Sage, Roſemary, and ſuch like,

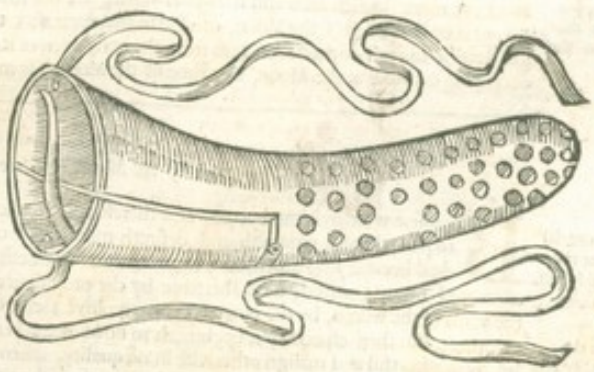
like, chymically drawn; this following is a convenient deſcriptiou of a Clyſter. ℞ *Radic. enulæ, camp. Iæos, ebuli, ariſtoloch. an.* ʒ j. *fol. abſynth. artemiſiæ, matricar. puleg. origani, an.* m.j. *baccarum lauri, juniperi & ſambuc. an.* p.j. *ſem. amnios, cymini, rutæ, an.* ʒ ij. *florum ſtæchados, roriſmar. ſalviæ, centaur. minor. an.* p.ij. *fiat decoctio, cape colaturæ,* ℔ j. *in qua diſſolve melle anthoſati, ſacc. rubr. & bened. an.* ʒ j. *diacharth.* ʒ ij. *olei aneth. nard. an.* ʒ j. ß. make thereof a Clyſter, and apply this plaſter following to the belly. ℞ *Maſſ. empl. oxycroci, & melilot. an.* ʒ iij. *olei nard.* as much as ſhall ſuffice to make it conveniently ſoft: make thereof a plaſter, and ſpread it on a leather, and apply it to the region of the belly when the fit is ended: if ſhe be married, let her forthwith uſe copulation, and be ſtrongly encountred by her husband, for there is no remedy more preſent than this.

A Clyſter ſcattering groſs vapours.

A quick, certain, and a pleaſant remedy for the ſuffocation of the Womb.

The deſcription of a Veſſel made with a Funnel or Pipe for to fumigate the Womb.

The form of a Peſſary to be put in the neck of the Womb, to hold it open.



Let the Midwife anoint her fingers with *oleum nardinum*, or *moſcheratinum*, or of Cloves, or elſe of Spike mixed with Musk, Ambergreece, Civet, and other ſweet Powders, and with theſe let her rub and tickle the top of the neck of the womb which toucheth the inner orifice, but her ſecret parts muſt firſt be warmed by the applying of warm linnen cloths, for ſo at length the venomous matter contained in the womb, ſhall be diſſolved and flow out, and the malign, ſharp, and flatulent vapours, whereby the womb is driven as it were into a fury or rage, ſhall be reſolved and diſſipated, and ſo when the conjunct matter of the diſeaſe is ſcattered and waſted, the womb, and alſo the Woman ſhall be reſtored unto themſelves again. Some 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 Womens Monethly Flux or Courſes.

USually they call the flux of bloud that iſſueth from the ſecret parts of Women, Monethly Flowers or Courſes, becauſe it happeneth to them every Moneth ſo long as they are in health. There be ſome which call them Terms, becauſe they return at their uſual time. Many of the French men call it *Sepmains*, becauſe in ſuch as ſit much, and are given to plentiful feedings, it endureth almoſt for the ſpace of ſeven days. Some call them purgations, becauſe that by this flux all a Womans body is purged of ſuperfluous humours. There be ſome alſo that call thoſe Fluxes the Flowers, becauſe that as in Plants the flower buddeth out before the fruits; ſo in Women-kind the Flux goeth before the iſſue, or the conception thereof.

The reaſon of the names of the monethly flux of women

For the Courſes flow not before a Woman be able to conceive, for how ſhould the ſeed being caſt into the Womb have his nouriſhment and increaſe, and how ſhould the child have his nouriſhment when it is formed of the ſeed, if this neceſſary humour were wanting in the womb? yet it may be

ſome

What women do conceive, this flux not appearing at all.

some Women may conceive without the flux of the Courses: but that is in such as have so much of the humour gathered together, as is wont to remain in those which are purged, although it be not so great a quantity that it may flow out, as it is recorded by *Aristotle*. But as it is in some very great, and in some very little, so it is in some seldom, and in some very often.

What women have this menstrual flux often, abundantly, and for a longer space than others.

There are some that are purged twice, and some 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 having slept all night, do notwithstanding lie in bed sleeping a great part of the day also, which live in a hot, moist, rainy 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 flux more seldom, less, and a far more short time than others.

But contrariwise, those that have small and obscure veins, and those that have their bodies more furnished and big either with flesh or with fat, are more seldom purged, and also more sparingly, because that the superfluous quantity of bloud useth to go into the habit of the body. Also tender, delicate and fair Women are less purged than those that are brown, and endued with a more compact flesh, because that by the rarity of their bodies, they suffer a greater wasting or dissipation of their substance by transpiration. Moreover, they are not so greatly purged with this kind of purgation, which have some other solemn or accustomed evacuation in any other place of their body, as by the nose or Hæmorrhoids.

Why young women are purged in the new of the Moon.

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 cause 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 humour.

Why old women are purged in the wane of the Moon.

Therefore young people which have much bloud, and more fluxible, and their bodies more fluxible, are soon moved unto a flux, although it be even in the first quarter of the Moons rising or increasing: but the humours of old women, because they wax stiff as it were with cold, and are not so abundant, and have more dense bodies and straighter vessels, are not so apt to a flux, nor do they so easily flow, except it be in the full of the Moon, or else in the decrease; that is to say, because the bloud that is gathered in the full of the Moon falls 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.

CHAP. L.

The Causes of the Monethly Flux or Courses.

The material cause of the Monethly flux.

BEcause a woman is more cold, and therefore hath the digestive faculty more weak, it cometh to pass, that she requireth and desireth more meat or food than she can digest or concoct. And because that superfluous humour that remaineth is not digested by exercise, nor by the efficacy 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, as its own certain and prefixed season or time.

When the Monethly flux begins to flow.

But then especially it beginneth to flow, and a certain rude portion of bloud to be expelled, being hurtful and malign otherwise in no quality, when Nature hath laid her principal foundations of the increase of the body, so that in greatness of the body she hath come as it were in a manner to the highest top, that is to say, from the thirteenth to the fiftieth year of her age.

The final cause.

Moreover, the child cannot be formed in the womb, nor have his nutriment or increase without this flux: therefore this is another final cause of the monethly flux.

A woman exceeds a man in quantity of bloud.

Many are persuaded that women do far more abound with bloud than men, considering how great an abundance of bloud they cast forth of their secret parts every moneth, from the thirteenth to the fiftieth year of their age: how much women great with child, of whom also many are menstrual, yield unto the nutriment and increase of the child in their wombs, and how much Physicians take from women that are with child by opening of a vein, which otherwise would be delivered before their natural and prefixed time; how great a quantity thereof they avoid in the birth of their children, and for ten or twelve days after, and how great a quantity of milk they spend for the nourishment of the child when they give suck, which milk is none other thing than bloud made white by the power of the kernels that are in the dugs, which doth suffice to nourish the child, be he great or little; yet notwithstanding many Nurses in the mean while are menstrual: and as that may be true, so certainly this may be true, that one dram (that I may so speak) of a mans bloud is of more efficacy to nourish and increase, than two pounds of womans bloud, because it is far more perfect, more concocted, wrought, and better replenished with abundance of spirits: whereby it cometh to pass that a man endued with a more strong heat, doth more easily convert what meat soever he eateth unto the nourishment and substance of his body; and if that any superfluity remains he doth eatily digest and scatter it by insensible transpiration.

A man exceedeth a woman in the quality of his bloud.

A man is more hot than a woman, and therefore not menstrual.

But a woman being more cold than a man, because she taketh more than she can concoct, doth gather together more humors, which because she cannot disperse, by reason of the unperfectness and weakness of her heat, it is necessary that she should suffer, and have her monthly purgation, especially when she groweth unto some bigness: but there is no such need in a man.

CHAP.

CHAP. LI.

The causes of the suppression of the Courses or Menstrual Flux.

THe Courses are suppressed or stopped by many causes, as by sharp, vehement, and long diseases, by fear, sorrow, hunger, immoderate labours, watchings, fluxes of the belly, great bleeding, hæmorrhoids, fluxes of bloud at the mouth, and evacuations in any other part of the body whatsoever, often opening of a Vein, great sweats, ulcers flowing much and long, scabbiness of the whole skin, immoderate grosness and clamminess of the bloud, 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 many women endeavour foolishly to make narrow: I speak nothing of age, greatness with child, and nursing of children, because these causes are not besides nature, neither do they require the help of the Physician.

The foolish endeavour of making the orifice of the womb narrow is rewarded with the discommodity of stopping of the Flowers.

Many Women, when their Flowers or Terms 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 City *Abdera* (saith *Hippocrates*) *Phaethusa* the wife of *Pythea* 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 body became manlike and rough, and had a beard, and her voice was great and shrill. The very 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 dry, or rather of a manly heat and driness, that they may so disperse 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 body. For thereof cometh Suffocation of the Womb, Head-ach, Swouning, beating of the Heart, and swelling of the breasts and secret parts, inflammation of the Womb, an Abscess, Ulcer, Cancer, a Fever, Nauseousness, Vomitings, difficult and slow concoction, the Dropsie, Strangury, the full Womb pressing upon the orifice of the bladder, black and bloudy Urin, by reason that portion of the bloud sweateth out into the bladder. In many Women the stopped matter of the Monethly Flux is excluded by Vomiting, Urin, and the Hæmorrhoids, in some it groweth into *Varices*. In my Wife when she was a Maid, the Menstrual matter was excluded and purged by the Nostrils. The Wife of *Peter Feure* of *Castelandun*, was purged of her Menstrual matter by the Dugs every moneth, and in such abundance, that scarce three or four cloaths were able to dry it and suck it up.

Why the strangury, or bloudiness of the Urin 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 some part or place of the body, there often follows difficulty of breathing, Melancholy, Madness, the Gout, an ill disposition of the whole body, dissolution of the strength of the whole body, want of appetite, a Consumption, the Falling-sickness, an Apoplexy.

Those whose bloud is laudable, yet not so abundant, do receive no other discommodity by the suppression of the Flowers, unless it be that the Womb burns or itcheth with the desire of copulation, by reason that the Womb is distended with hot and itching bloud, 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 any chance contrary to Nature, as those Women which did never conceive, because they have been used to be filled; and the vessels by reason of their customary repletion and distention are more large and capacious: when the Courses flow, the appetite is partly dejected, for that Nature being then wholly applied to expulsion, cannot throughly concoct or digest; the Face waxeth pale and without its lively colour, because that the heat with the spirits, go from without inwards, so to help and aid the expulsive faculty.

To what women the suppression of the Moneths is most grievous.

CHAP. LIII.

Of provoking the Flowers or Courses.

THe suppression of the Flowers is a plethorick Disease, and therefore must be cured by evacuation, which must be done by opening the Vein called *Sapbena*, which is at the ankle, but first let the basilick Vein of the arm be opened, especially if the body be plethorick, lest that there should a greater attraction be 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 be seen, it will be very profitable to apply Horse-leeches to the neck thereof: Pessaries for Women may be used, but fumigations of aromatick things are more meet for Maids, because they are bashful and shame-faced. Unguents, Liniments, Emplasters, Cataplasms that serve for that matter, are to be prescribed and applied to the secret parts; Ligatures and Fri-

Why the Vein called *Basilica* in the arm must be opened before the Vein *Sapbena* in the foot.

Horse-leeches to be applied to the neck of the Womb.

ctions of the thighs and legs are not to be omitted, fomentations and ſternutatories are to be uſed, and Cupping-glaſſes are to be applied to the groins; walking, dancing, riding, often and wanton copulation with her husband, and ſuch like exerciſes, provoke the Flowers. Of Plants, the Flowers of St. *Johns* Wort, the Roots of Fennel, and Aſparagus, Bruſcus or Butchers-broom, or Parſly, Brook-lime, Baſil, Balm, Betony, Garlick, Onions, Criſta Marina, Coſtmary, the Rind or Bark of Caſſia Fiſtula, Calamint, Origanum, Penniroyal, Mugwort, Thyme, Hyſſop, Sage, Marjoram, Roſemary, Hore-hound, Rue, Savin, Spurge, Saffron, Agarick, the Flowers of Elder, Bay-berries, the Berries of Ivy, Scammony, Cantharides, *Pyrethrum* or Pellitory of Spain, *Euphorbium*. The aromatick things are *Amomum*, Cinnamon, Squinanth, Nutmegs, *Calamus Aromaticus*, *Cyperus*, Ginger, Cloves, Galingal, Pepper, Cubibes, Amber, Muſk, Spikenard, and ſuch like; of all which let Fomentations, Fumigations, Baths, Broths, Boles, Potions, Pills, Syrups, Apozems, and Opiats, be made as the Phyſician ſhall think good.

Plants that provoke the Flowers.

Sweet things.

The Apozeme that followeth is proved to be very effectual: ℞ *Fol. & flor. dictam. an.* p.ij. *pimpinel.* m. ß. *omnium capillar. an.* p. j. *artemiſ. thymi, marjor. origan. an.* m. ß. *rad. rub. major. petroſelin. fœnicul. an.* ℥ j. ß. *rad. pæon. biſtort. an.* ℥ ß. *cicerum rub. ſem. pæon. fœnicul. an.* ℥ ß. make thereof a decoction in a ſufficient quantity of Water, adding thereto Cinnamon ℥ iij. in one pint of the decoction diſſolve (after it is ſtrained) of the Syrup of Mugwort and of Hyſſop, *an.* ℥. ij. *diarrhod. abbat.* ℥ j. let it be ſtrained through a bag, with ℥ ij. of the Kernels of Dates, and let her take ℥ iv. in the morning.

An apozeme to provoke the Flowers.

Let Peſſaries be made with *Galbanum*, *Ammoniacum*, and ſuch like mollifying things, beaten into a maſs in a mortar with a hot peſtle, and made into the form of a Peſſary, and then let them be mixed with Oil of Jaſmine, *Euphorbium*, an Ox-gall, the Juice of Mugwort, and other ſuch like, wherein there is power to provoke the Flowers, as with Scammony in Powder: let them be as big as ones thumb, ſix fingers long, and rowled in Lawn, or ſome ſuch like thin linnen cloth; of the ſame things Nodulaes may be made. Alſo Peſſaries may be prepared with Honey boiled, adding thereto convenient powders, as of Scammony, Pellitory, and ſuch like. Neither ought theſe to ſtay long in the neck of the Womb leſt they ſhould exulcerate, and they muſt be pulled back by a thred that muſt be put through them, and then the orifice of the Womb muſt be fomented with white Wine of the decoction of Penniroyal or Mother-wort.

But it is to be noted, that if the ſuppreſſion of the Flowers happeneth through the default of the ſtopped orifice of the Womb, or by inflammation, theſe maladies muſt firſt be cured before we come unto thoſe things that of their proper ſtrength and virtue provoke the Flowers: as for example, if ſuch things be made and given when the Womb is inflamed, the bloud being drawn into the grieved place, and the humours ſharpened, and the body of the Womb heated, the inflammation will be increaſed. So if there be any ſuperfluous fleſh, if there be any Callus of a wound or ulcer, or if there be any membrane ſhutting the orifice of the Womb, and ſo ſtopping the flux of the Flowers they muſt firſt be conſumed and taken away before any of thoſe things be adminiſtred. But the opportunity of taking and applying of things, muſt be taken from the time wherein the ſick Woman was wont to be purged before the ſtopping, or if ſhe never had the Flowers, in the decreaſe of the Moon; for ſo we ſhall have Cuſtom, Nature, and the external efficient cauſe to help Art. When theſe Medicins are uſed, the Women are not to be put into Baths or Hot-houſes, as many do, except the malady proceed from the denſity of the Veſſels, and the groſsneſs and clammineſs of the bloud. For Sweats hinder the menſtrual Flux, by diverting and turning the matter another way.

What cauſes of the ſtopping of the Flowers muſt be cured before the diſeaſe it ſelf.

The fineſt time to provoke the Flowers.

Why Hot-houſes do hurt thoſe in whom the Flowers are to be provoked.

CHAP. LIV.

The ſigns of the approaching of the Menſtrual Flux.

WHen the Monethly flux firſt approacheth, the Dugs itch and become more ſwollen and hard than they are wont; the woman is more deſirous of copulation, by reaſon of the ebullition of the provoked bloud, and the acrimony of the bloud that remaineth; her voice becometh bigger, her ſecret parts itch, burn, ſwell, and wax red. If they ſtay long, ſhe 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, be cold, they loath the act of generation, by reaſon that the Womb waxeth feeble through ſluggiſhneſs and watery humours filling the ſame, and it floweth by the ſecret parts very ſoftly. Thoſe Maids that are marriageable, although they have the menſtrual flux very well, yet they are troubled with Head-ach, nauſeouſneſs, and often vomiting, want of appetite, longing, an ill habit of body, difficulty of breathing, trembling of the heart, ſwouning, melancholy, fearful dreams, watching with ſadneſs and heavineſs, becauſe that the genital parts burning and itching, they imagine the act of generation, whereby it cometh to paſs that the ſeminal matter, either remaining in the teſticles in great abundance, or elſe poured into the hollowneſs of the Womb by the tickling of the genitals, is corrupted, and acquireth a venomous quality, and cauſeth ſuch like accidents as happen in the ſuffocation of the Womb.

What women do love, and what women do loath the act of generation when the moneths are ſtopped.

With what accidents thoſe that are marriageable and are not married, are troubled.

The cauſe of ſo many accidents.

Maids that live in the Country are not ſo troubled with thoſe Diſeaſes, becauſe there is no ſuch lying in wait for their Maiden-heads, and alſo they live ſparingly and hardly, and ſpend their time in continual labour. You may ſee many 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 quantity as Nurſes, as we read it recorded by *Hippocrates*. If a Woman which is neither great with child, nor hath born children, hath milk, ſhe wants the menſtrual fluxes; whereby you may underſtand that that concluſion is not good which affirmeth that a Woman which hath milk in her breſts, either to be delivered of child, or to be great with child; for *Cardanus* writeth that he knew one

Hipp. 36. ſect. 5.

Lib. 2. de ſuper.

one *Antony Burzus* at *Genua*, who being thirty years of age, had so much milk in his breasts as was sufficient to nurse a child; for the breeding and efficient cause of milk proceeds not onely from the engrafted faculty of the glandulous substance, but much rather from the action of the mans seed, for proof whereof you may see many men that have very much milk in their breasts, and many women that almost have no milk, unless they receive mans seed. Also Women that are strong and lusty like unto men, which the Latines call *Viragines*, that is to say, whose seed cometh 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 becometh perfect milk: those that have the Flowers plentifully and continually for the space of four or five days, are better purged and with more happy success than those that have them for a longer time.

The efficient cause 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 many accidents; for the concoction is frustrated, the appetite overthrown, then follows coldness throughout all the body, exolution of all the faculties, an ill habit of all the body, Leanness, the Dropsie, an Hectick Fever, Convulsion, Swouning, and often sudden death: if any have them too exceeding immoderately, the bloud is sharp and burning, and also stinking, the sick woman is also troubled with a continual Fever, and her tongue will be dry, 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 end in the bottom and sides of the womb; but in virgins and in women great with child, whose children are sound and healthful, by the branches of the Hypogastrick vein and artery, which are spred and dispersed over the neck of the womb. The cause of this immoderate flux is in the quantity or quality of the bloud; 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 faculty of the vessels: oftentimes also the Flowers flow immoderately by reason of a painful and a difficult birth of the child, or the after-birth, being 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 coming forth of the Infant with great travel, and many times by the use of sharp Medicins, and exulcerating Pessaries. Oft-times also Nature avoids all the juice of the whole body critically by the womb after a great disease, which flux is not rashly or suddenly to be stopped. That menstrual bloud that floweth from the womb, is more gross, black, and clotty, but that which cometh from the neck of the womb is more clear, liquid and red.

By what pores the Flowers do flow in a Woman and in a Maid.
The causes of an unreasonable flux of bloud.
The critical flux of the Flowers.
The signs of bloud 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 bloud; 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 Barly-waters, sodden Rice, the extreme parts of Beasts, as of Oxen, Calves, Sheep, either fried or sodden with Sorrel, Purslain, Plantain, Shepherds-purse, Sumach, the buds of Brambles, Berberies, and such like. It is supposed that a Harts-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 flower of Wheat, Barley, Beans, or Rice, is very effectual for the same. Quinces, Cervices, Medlars, Cornelian-berries, or Cherries, may likewise be eaten at the second Course. Julips are to be used of steeled waters, with syrup of dry Roses, Pomegranats, Sorrel, Myrtles, Quinces, or old Conserves of red Roses, but Wine is to be avoided: but if the strength be so extenuated, that they require it, you must chuse gross and astringent Wine tempered with steeled water; exercises are to be shunned, especially Venerous Exercises, Anger is to be avoided, a cold air is to be chosen, which (if it be not so naturally) must be made so by sprinkling cold things on the ground, especially if the Summer or heat be then in his full strength; sound sleeping stays all evacuations except sweating. The opening of a Vein in the arm, Cupping-glasses fastened on the breasts, hands, and painful frictions of the upper parts are greatly commended in this malady.

But if you perceive that the cause of this accident lieth in a cholerick ill juice mixed with the bloud, the body must be purged with Medicins that purge choler and water, as Rhubarb, Myrobalans, Tamarinds, Sebestens, and the purging Syrup of Roses.

The institution or order of life.
Purging.

CHAP. LVII.

Of local Medicins to be 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 be the form of an Unguent. ℞ *Ol. Mastich. & myrt. an.* ʒ ij. *nucum cupr. olibani, myrtil. an.* ʒ ij. *succi rosar. rubr.* ʒ ij. *pulv. mastichin.* ʒ ij. *boli armen. terræ sigillat. an.* ʒ β. *ceræ quantum sufficit, fiat unguentum.* An injection may be thus made. ℞ *Aq. plantag. rosar. rubr. bursæ pastor. centinodii, an.* ℔ β. *corticis querni, nucum cupressi, gallar. non maturar. an.* ʒ ij. *berberis,*

An unguent.
An astringent injection.

berberis, sumach. balaust. alumin. roch. an. ʒ. j. make thereof a decoction, and inject it in a syringe blunt-pointed into the Womb, left if it should be sharp, it might hurt the sides of the neck of the womb, also Snails beaten with their shells, and applied to the navel, are very profitable. Quinces rosted under the Coals, 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 pessary may be thus:

Astringent Pessaries.

℞ *Gallar. immaturar. combust. & in aceto extinctar.* ʒ ij. *ammo.* ʒ ß. *sang. drac. pulv. rad. symphyt. sumach. mastich. succi acaciæ, corni cerust. colophon. myrrhæ, scoriæ ferri, an.* ʒ j. *caphur.* ϑ ij. mix them, and incorporate them all together with the juice of Knot-grass, Syn-green, Night-shade, Henbane, Water-lillies, Plantain, of each as much as is sufficient, and make thereof a Pessary.

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 come by erosion, so that the matter thereof continually exulcerateth the neck of the womb, let the place be anointed with the milk of a she-Ass, with Barley-water, or binding and astringent mucilages, as of Psillium, Quinces, Gum Tragacanth, Arabick, and such like.

CHAP. LVIII.

Of Womens Fluxes, or the Whites.

The reason of the name. The differences.

BEsides the fore-named Flux, which by the Law of Nature happeneth to Women monethly, there is also another called a *Womans Flux*, because it is onely proper and peculiar to them: this sometimes weareth the Woman with a long and continual distillation from the womb, or through the womb, coming from the whole body without pain, no otherwise than when the whole superfluous filth of the body is purged by the reins or urin; sometimes it returneth at uncertain seasons, and sometimes with pain and exulcerating the places of the womb: it differeth from the menstrual Flux, because that this for the space of a few days, as it shall seem convenient to Nature, casteth forth laudable bloud; but this *Womans Flux* yieldeth impure juice, sometimes sanious, sometimes serous and livid, otherwhiles white and thick, like unto Barly-cream, proceeding from flegmatick bloud: this last kind thereof is most frequent. Therefore we see women that are flegmatick, and of a soft and loose habit of body, to be often troubled with this disease; and therefore they will say among themselves that they have the Whites. And as the matter is diverse, so it will stain their smocks with a different colour. Truly if it be perfectly red and sanguin, it is to be thought it cometh by erosion, or the exsolution of the substance of the vessels of the womb, or of the neck thereof: therefore it cometh very seldom of bloud, and not at all except the woman be either great with child, or cease to be menstrual for some other cause; for then in stead of the monethly flux there floweth a certain whayish excrement, which staineth her cloaths with the colour of water wherein flesh is washed.

What women are apt to this flux.

Womens flux cometh very seldom of bloud.

Also it very seldom proceeds of a melancholick humour, and then for the most part it causeth a Cancer in the womb. But oftentimes the purulent and bloudy matter of an ulcer lying hidden in the womb, deceiveth the unskilful Chirurgeon or Physician: but it is not so hard to know these diseases one from the other; for the matter that floweth from an ulcer, because (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 be known from the white Flowers.

CHAP. LIX.

Of the causes of the Whites.

SOmetimes the cause of the Whites consisteth in the proper weakness of the womb, or else in the uncleanness thereof; and sometimes by the default of the principal parts. For if the brain or the stomach be cooled, or the liver stopped or scirrhous, many crudities are engendred, which if they run, or fall down into the womb that is weak by Nature, they cause the flux of the Womb or Whites: but if this Flux be moderate, and not sharp, it keepeth the body 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 very hard to perswade the sick woman, because that her mind and heart will be almost broken, by reason of the shame that she taketh, because such filth floweth continually; it hindereth conception, because it either corrupteth, or driveth out the seed when it is conceived. Oftentimes if it stoppeth for a few Moneths, the matter that stayeth there causeth an abscess about the womb in the body or neck thereof; and by the breaking of the abscess there followeth rotten and cancerous ulcers, sometimes in the womb, sometimes in the groin, and often in the hips.

How a Womans flux is wholesom.

How it causeth diseases.

How it letteth the conception.

This disease is hard to be cured, not onely by reason of it self, as because all the whole filth and superfluous excrements of a womans body floweth down into the womb, as it were into a sink; because it is naturally weak, hath an inferiour situation, many vessels ending therein; and last of all, because the Courses are wont to come through it; as also by reason of the sick woman, who oftentimes had rather die than to have that place seen, the disease known, or permit local Medicins to be applied thereto: for so saith *Montanus*, that on a time he was called to a Noble-woman of *Italy*, who was troubled with this disease, unto whom he gave counsel to have cleansing decoctions injected into her womb; which when she heard, she fell into a swound, and desired her husband never thereafter to use his counsel in any thing.

Why it is hard to be cured.

An History.

CHAP.

CHAP. LX.

The Cure of the Whites.

IF the matter that floweth out in this diſeaſe be of a red colour, it differeth from the natural Monethly flux in this onely, becauſe it keeps no order or certain time in its returning. Therefore Phlebotomy and other remedies which we have ſpoken of, as requiſite for the menſtrual flux, when it floweth immoderately, is here neceſſary to be uſed. But if it be white, or doth teſtifie or argue the ill juice of this or that humour by any other colour, a Purgation muſt be preſcribed of ſuch things as are proper to the humour that offends: for it is not good to ſtop ſuch a flux ſuddenly, for it is neceſſary that ſo the body ſhould be purged of ſuch filth or abundance of humours; for they that do haſten to ſtop it, cauſe the dropſie by reaſon that this ſink of humours is turned back into the liver; or elſe a Cancer in the Womb, becauſe it is ſtaid there; or a Fever, or other diſeaſes, according to the condition of the part that receiveth it. Therefore we muſt not come to local deterſives, deſiccatives, reſtrictives, unleſs we have firſt uſed univerſal remedies according to Art. Alum-baths, baths of Brimſtone, and of bitumen, or iron, are convenient for the Whites that come of a phlegmatick humour; in ſtead whereof baths may be made of the decoction of herbs that are hot, dry, and indued with an aromatick power, with Alum and Pebles, or Flint-ſtones red hot thrown into the ſame. Let this be the form of a cleanſing decoction and injection. ℞ *Fol. abſynth. agrim. centinod. burſ. paſt. an.* m. ß. boil them together, and make thereof a decoction, in which diſſolve *mellis roſar.* ℥ ij. *aloes, myrrhæ, ſalis nitri, an.* ℥ j. make thereof an injection the woman being ſo placed on a pillow under her buttocks that the neck of the Womb being more high, may be wide open: when the injection is received, let the Woman ſet her legs acroſs, and draw them up to her buttocks, and ſo ſhe may keep that which is injected. They that endeavour to dry and bind more ſtrongly, add the juice of *acatia*, green galls, the rinds of Pomegranats, Roch-alum, Romane Vitriol, and they boil them in Smiths water and Red wind; peſſaries may be made of the like faculty.

If the flux of a Woman be red, wherein it differeth from the menſtrual flux.

A Womans flux is not ſuddenly to be ſtopped.

What baths are profitable.

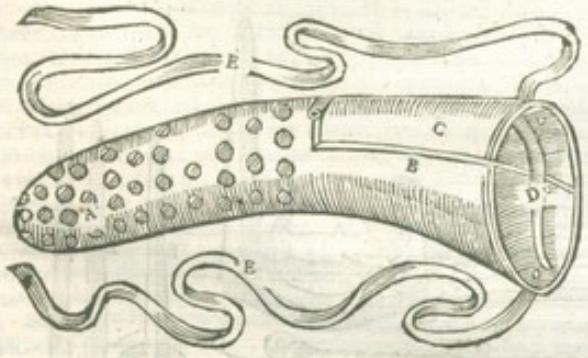
An aſtringent injection.

If the matter that cometh forth be of an ill colour or ſmell, it is like that there is a rotten ulcer; therefore we 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 involuntary flux of the ſeed, cloaking the fault with an honeſt name, do untruly ſay that they have the Whites, becauſe that in both theſe diſeaſes a great abundance of filth is avoided. But the Chirurgeon may eaſily perceive that malady by the rottenneſs of the matter that floweth out, and he ſhall perſuade himſelf that it will not be cured without ſalivation or fluxing at the mouth, and ſweats. In the mean while let him put in an inſtrument made like unto a peſſary, and cauſe the ſick woman to hold it there: this inſtrument muſt have many 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 be kept more temperate and cool by receiving the air, by the benefit of a ſpring whereby this Inſtrument, being made like unto a peſſary, 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 Peſſary, whereby the Womb may be ventilated.



A *Sheweth the end of the Inſtrument, which muſt have many holes therein.*
B *Sheweth the body 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 receive the air more freely.*
D *Sheweth the Spring.*
EE *Shew the Laces and Bands to tie about the Patients body, that ſo the Inſtrument may be ſtaid and kept faſt in his place.*

CHAP. LXI.

Of the Hæmorrhoids *and Warts of the neck of the Womb.*

LIke as in the Fundament, ſo in the neck of the Womb there are Hæmorrhoids, and as it were varicous Veins, oftentimes flowing with much bloud, or with a red and ſtinking whayiſh humour. Some of theſe, by reaſon of their redneſs and great inequality as it were of knobs, are like unripe Mulberries, and are called vulgarly *Venæ morales*, that is to ſay, the Veins or Hæmorrhoids like unto Mulberries: others are like unto Grapes, and therefore are named *Uvales*: other ſome are like unto Warts, and therefore are called *Venæ verucales*: ſome appear and ſhew themſelves with a great tumor, others are little, and in the bottom of the neck of the Womb; others are in

The differences of the Hæmorrhoids of the neck of the Womb.

What an *Acrochordon* is.

the side or edge thereof. *Acrochordon* is a kind of Wart with a callous bunch or knot, having 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*.

What a *Thymus* is.

There is also another kind of Wart, which because of its great roughness and inequality, is called *Thymus*, as resembling the flower of Thyme. All such diseases are exasperated and made more grievous by any exercise, especially by venerous acts: many times they have a certain malignity, and an hidden virulency joined with them, by occasion whereof they are aggravated even by touching onely, because they have their matter of a raging humour; therefore to these we may not rightly use a true, but onely the palliative cure, as they term it: the *Latins* call them onely *Ficus*, but the *French* men name them with an adjunct, Saint *Fiacrius* Figs.

S. *Fiacrius* figs.

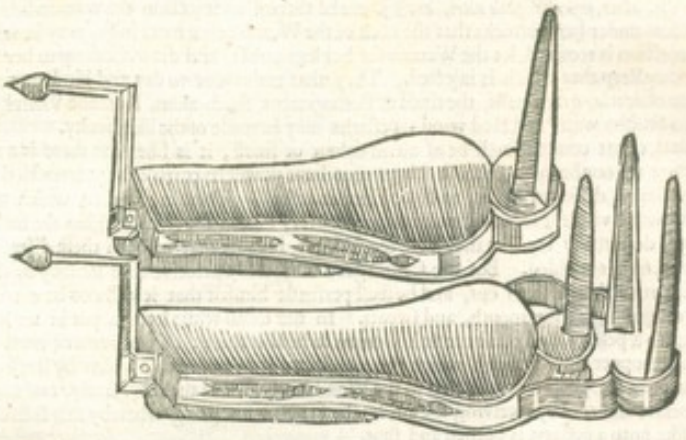
CHAP. LXII.

Of the Cure of the Warts that are in the neck of the Womb.

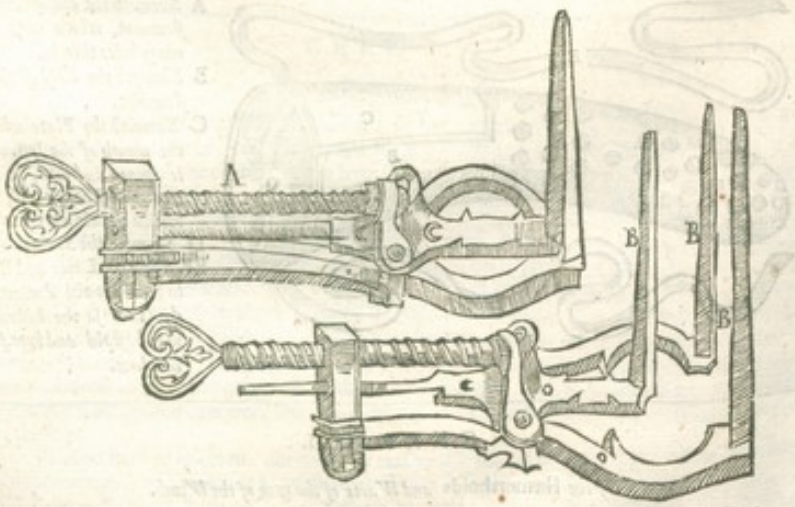
What Warts of the Womb must be bound and so cut off.

THe Warts that grow in the neck of the Womb, if they be not malignant, are to be tied with a thred, and so cut off. Those that lie hid more deep in the Womb, may be seen and cured by opening the *Matrix* with a dilater made for the purpose.

Divers Speculum 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 stretcheth and openeth the Dilater of the* Matrix.
B *Sheweth the Arms or Branches of the Instrument, which ought to be eight or nine fingers long.*

But these Dilaters of the Matrix ought to be of a bigness correspondent to the Patients body; let them be put into the Matrix, when the woman is placed as we have said, when the child is to be drawn out of her body. That instrument is most meet to tie the Warts, which we have described in the relaxation

laxation of the Palat or *Vvula*: let them be tied harder and harder every day until they fall away. Therefore for the curing of Warts there are three chief scopes, as Bands, Sections, Cauterics; and left they grow up again, let Oil of Vitriol be dropped on the place, or *Aqua fortis*, or some of the lee whereof potential Cauteries are made. This Water following is most effectual to consume and waste Warts. ℞ *Aq. plantag.* ℥ vj. *virid. æris* ʒ ij. *alum. roch.* ʒ iij. *sal. com.* ʒ ß. *vit. rom. & sublim. an.* ʒ ß. beat them all together, and boil them; let one or two drops of this water be dropped on the grieved place, not touching any place else; but if there be an ulcer, it must be cured as I have shewed before. A certain man studious of Physick, of late affirmed to me, that Ox-dung tempered with the leaves or powder of Savin, would waste the Warts of the womb, if it were applied thereto warm; which, whether it be true or not, let Experience, the Mistress of things, be judge. 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 proved by experience, that the Warts that grow on the hands, may be cured by applying of Purslain beaten or stamped in its own juice. The Leaves 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 very long little Ulcers with pain very sharp and burning, by reason of the biting of an acrid, salt and dry humour, making so great a contraction, and often-times narrowness in the fundament and the neck of the womb, that scarcely the top of ones finger may be 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 sometimes 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 be used, and the grieved place or part is to be moistned with Fomentations, Liniments, Cataplasms, Emplasters; and if the malady be in the Womb, a dilater of the matrix or pessary must be put thereinto very often, so to widen that which is over hard, and too much drawn together or narrow, and then the cleft little ulcers must be cicatrized. *Condylomata* are certain wrinkled and hard bunches, and as it were excrescences of the flesh, rising especially in the wrinkled edge of the fundament and neck of the womb. Cooling and relaxing medicins ought to be used against this disease, 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 be an inflammation, put thereto a little Camphir.

What Chaps are.

The Cure.

What *Condylomata* are.

The Cure.

CHAP. XLIV.

Of the itching of the Womb.

IN Women, especially such as are old, there oftentimes cometh 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 kind of malady, that she 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 *Ægyptiacum* 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 Medicin, and put them up into the Womb, and so she was cured. Many times this itch cometh in the fundament or testicles of aged men, by reason of the gathering together or conflux of salt phlegm, which when it falleth into the eyes, it causeth the Patient to have much ado to refrain scratching: when this matter hath dispersed into the whole habit of the body, it causeth a burning or itching scab, which must be cured by a cooling and moistning diet, by phlebotomy and purging of the salt humour, by baths and horns applied, with scarification and anointing the whole body with the Unction following. ℞ *Axung. porcin. recent.* lb j. ß. *sap. nig. vel gallici, salis nitri, affat. tartar. staphysag. an.* ℥ ß. *sulph. viv.* ℥ j. *argent. viv.* ʒ ij. *acet. ros. quart.* j. incorporate them all together, and make thereof a liniment according to Art, and use it as is said before: *Unguentum emulatum cum Mercurio* is thought to have great force, not without desert, to assuage the itch, and dry scab. Some use this that followeth: ℞ *Alum. spum. nitr. sulph. viv. an.* ʒ vj. *staphys.* ℥ j. let them all be dissolved in Vinegar of Roses, adding thereto *Butyr. recent. q. s.* make thereof a liniment for the fore-named use.

What the itch of the Womb.

An History.

The cause of the itch.

The virtue of *unguent. emulat.*

CHAP. LXV.

Of the relaxation of the great Gut, or Intestine, which happeneth to Women.

MAny Women that have had great travail and strains in Child-birth, have the great intestine (called of the Latins, *Crassum intestinum*) or Gut, relaxed and slipped down; which kind of affect happeneth much to children, by reason of a phlegmatick humour 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 strait Gut, is to be fomented with a decoction of heating and resolving herbs, as of Sage, Rosemary, Lavender, Tyme, and such like; and then of astringent things, as of Roses, Myrtils, the rinds of Pomegranats, Cypress-nuts, Galls, with a little Allum; then it must be sprinkled with the Powder of things that are astringent without biting: and last

The Cause.

The Cure.

An effectual remedy.

last of all, it is to be reſtored, and gently put into its place. That is ſuppoſed to be an effectual and ſingular remedy for this purpoſe, which is made of twelve 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 humour, which muſt be put upon Cotton, and applied to the Gut that is fallen down.

The differences and ſigns.

By the ſame cauſe (that is to ſay, of painful child-birth in ſome women) there ariſeth a great ſwelling in the Navel; for when the *Peritonæum* is relaxed or broken, ſometimes the Kall, and ſometimes the Guts ſlip out: many times flatulences come thither, the cauſe, as I now ſhewed, is over great ſtraining or ſtretching of the belly, by a great burthen carried in the Womb, and great travel in child-birth: if the fallen-down Guts make that tumor, pain joined together with that tumor doth vex the Patient; and if it be preſſed, you may hear the noiſe of the guts going back again: if it be the Kall, then the tumor is ſoft, and almoſt without pain, neither can you hear any noiſe by compreſſion: if it be wind, the tumor is looſe and ſoft, yet it is ſuch as will yield to the preſſing of the finger with ſome ſound, and will ſoon return again: if the tumor be great, it cannot be cured, unleſs the *Peritonæum* be cut, as

An Hiſtory.

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 becauſe the *faeces* 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.

CHAP. LXVI.

Of the relaxation of the Navel in Children.

OFtentimes in Children newly born, the Navel ſwelleth as big as an Egg, becauſe it hath not been well cut or bound, or becauſe the whayiſh humours are flowed thither, or becauſe that part hath extended it ſelf too much by crying, by reaſon of the pains of the fretting of the Childs guts, many times the Child bringeth that tumor joined with an abſceſs with him from his Mothers Womb: but let not the Chirurgeon aſſay to open that abſceſs, for if it be opened, the guts come out through the inciſion, as I have ſeen in many, and eſpecially in a Child of my Lord *Martigues*; for when *Peter* of the Rock, the Chirurgeon, 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 Lords

An abſceſs not to be opened.

An Hiſtory.

retinue that were there, had ſtrangled the Chirurgeon. Therefore when *John Gromontius* the Carver deſired me, and requeſted me of late that I would do the like in his Son; I refuſed to do it, becauſe it was in danger of its life by it already; and in three days after the abſceſs broke, and the bowels guſhed out, and the child died.

CHAP. LXVII.

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 cauſe great pain when they begin to break as it were out of their ſhell or ſheath, and begin to come forth, the gums being broken, which for the moſt part happeneth about the ſeventh moneth of the Childs age. This pain cometh with itching and ſcratching of the gums, an inflammation, flux of the belly, whereof many times cometh a Fever, falling of the Hair, a Convulſion, at length death.

The cauſe of the pain in breeding Teeth.

The cauſe of the pain is the ſolution of the continuity of the Gums by the coming forth of the Teeth.

The ſigns.

The ſigns of that pain is an unaccuſtomed burning, or heat of the Childs mouth, which may be perceived by the Nurſe that giveth it ſuck, a ſwelling of the Gums and Cheeks, and the Childs being more wayward and crying than 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.

The Cure.

That the Phyſician may remedy this, he muſt cure the Nurſe as if ſhe had the Fever, and ſhe muſt not ſuffer the Child to ſuck ſo often, but make him cool and moiſt, when he thirſteth, by giving him at certain times *Syrupus Alexandrinus, ſyrup. de Limonibus*, or the ſyrup of Pomgranats with boiled Water; yet the Child muſt not hold thoſe things that are actually cold long in his mouth, for ſuch by binding the Gums, do in ſome ſort ſtay the Teeth that are newly coming forth; but things that lenifie and mollifie are rather to be uſed, that is to ſay, ſuch things as do by little and little relax the looſe fleſh of the Gums, and alſo aſſwage the pain. Therefore the Nurſe ſhall oftentimes rub the Childs Gums with her fingers anointed or beſmeared with Oil of ſweet Almonds, freſh Butter, Honey, Sugar, mucilage of the ſeeds of *Pſilium*, or of the ſeeds of Marſh-mallows extracted in the water of Pellitory of the Wall. Some think that the brain of a Hare, or of a ſucking Pig roaſted or ſodden, through a ſecret property, are effectual for the ſame: and on the out-ſide ſhall be applied a Cataplaſm of Barly-meal, Milk, Oil of Roſes, and the Yolks of Eggs. Alſo a ſtick of Liquorice ſhaven and bruiſed and anointed with Honey, or any of the fore-named Syrups, and often rubbed in the mouth or on the gums, is likewiſe profitable: ſo is alſo any Toy for the Child to play withall, wherein a Wolves tooth is ſet, for this by ſcratching doth aſſwage the painful itching, and rariſie the Gums, and in ſome weareth them that the Teeth appear the ſooner. But many times it happeneth that all theſe and ſuch like medicins profit nothing at all, by reaſon of the contumacy of the gums, by hardneſs or the weakneſs of the Childs nature; therefore in ſuch a caſe, before the fore-named mortal accidents come, I would perſuade the Chirurgeon 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 way for them, notwithſtanding that a little flux of bloud will follow by the tention of the gums: of which kind of remedy I have with proſperous and happy ſucceſs made trial in ſome of mine own Children in the preſence of *Fœreus*, *Alinus*, and *Cortius*,

What power ſcratching of the gums hath to aſſwage the pain of them.

Doctors

Doctors of Physick, and *Guillemeau* the Kings Chirurgeon, which is much better and more safe than to do as some Nurses do, who, taught onely by the instinct of Nature, with their nails and scratching, break and tear, or rent the Childrens gums. The Duke of *Nevers* had a son of eight moneths old, which died of late, and when we, with the Physicians that were present, diligently sought for the cause of his death, we could impute it unto nothing else than to the contumacious hardness of the gums, which was greater than was convenient for a child of that age; for therefore the Teeth could not break forth, nor make a passage for themselves to come forth: of which our judgment this was the trial, that when we cut his gums with a knife, we found all his Teeth appearing as it were in an array, ready to come forth, which if it had been done when he lived, doubtless he might have been preserved. An History.

The End of the Four and Twentieth Book.

BOOK XXV.

Of MONSTERS *and* PRODIGIES.

THE PREFACE.

WE call Monsters, what things soever are brought forth contrary to the common decree and order of Nature. So we term that Infant monstrous which is born with one arm alone, or with two heads. But we define Prodigies, those things which happen contrary to the whole course of Nature, that is, altogether differing and dissenting from Nature: as if a man should be delivered of a Snake or a Dog. Of the first sort are thought all those, in which any of those things which ought, and are accustomed to be, according to Nature, is wanting, or doth abound, is changed, worn, covered, or deformed, hurt, or not put in its right place: for sometimes some are born with more fingers than they should, other some but with one finger: some with those parts divided which should be joined, others with those parts joined which should be divided: some are born with the privities of both sexes, male and female. And Aristotle *saw a Goat with a horn upon her knee. No living Creature was ever born which wanted the Heart, but some have been seen wanting the Spleen, others with two Spleens, and some wanting one of the Reins. And none have been known to have wanted the whole Liver, although some 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, contrary to its natural site, hath lien on the left side, and the Spleen on the right. Some Women also have had their Privities closed, and not perforated, the membranous obstacle, which they call the* Hymen, *hindering. And men are sometimes born with their Fundaments, Ears, Noses, and all the rest of the passages shut, and accounted monstrous, Nature erring from its intended scope. But to conclude, those Monsters are thought to portend some ill, which are much differing from their Nature.* What a Monster is. What a Prodigy is. *Lib. 4. gen. anim. cap. 4.*

CHAP. I.

Of the causes of Monsters; and first of those Monsters which appear for the glory of God, and the punishment of Mans wickedness.

THere are reckoned up many causes of Monsters, the first whereof is the glory of God, that his immense power may be manifest to those which are ignorant of it, by the sending of those things which happen contrary to Nature: for thus our Saviour Christ answered the Disciples (asking whether *He* or his *Parents* had offended, who being *born blind*, received his sight from him) that neither *He* nor his *Parents* had committed any fault so great, but this so happened onely that the *glory* and majesty of God should be divulged by that miracle, and such great works.

Another cause is, that God may either punish mens wickedness, or shew signs of punishment at hand, because Parents sometimes lie and join themselves 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

The Figure of a Colt with a Mans Face.

At *Verona*, *An. Dom.* 1254. a Mare foaled a Colt with the perfect face of a Man, but all the rest of the body like an Horse: a little after that the Wars between the *Florentines* and *Pisans* began, by which all *Italy* was in a combustion.

The Figure of a winged Monster.

About the time that Pope *Julius* the second raised up all *Italy*, and the greatest part of Christendom against *Lewis* the Twelfth, the King of *France*, in the Year of our Lord 1512. (in which Year, upon Easter day, near *Ravenna* was fought that mortal battle, in which the Popes Forces were overthrown) a Monster was born in *Ravenna*, having 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 eye, the Privities of male and female, the rest of the body like a man, as you may see by this Figure.

The third cause is, an abundance of seed and overflowing matter. The fourth, the same in too little quantity, and deficient. The fifth, the force and efficacy of imagination. The sixth, the straightness of the Womb. The seventh, the disorderly site of the party with child, and the position of the parts of the body. The eighth, a fall, strain, or stroak, especially upon the belly of a woman with child. The nineth, hereditary diseases, or affects by any other accident. The tenth, the confusion and mingling together of the seed. The eleventh, the craft and wickedness of the Devil. There are some others which are accounted for Monsters, because their original or essence full of admiration, or do assume a certain prodigious form by the craft of some begging Companions; therefore we 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 we have already handled the two former and truly final causes of Monsters, we must now come to those which are material, corporeal, and efficient causes, taking our beginning from that we 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 any time a Creature bearing one at once, as Man, shall cast forth more seed in copulation than is necessary to the generation of one body, it cannot be that onely one should be begot of all that: therefore from thence either two or more must arise: whereby it cometh to pass, that these are rather judged wonders, because they happen seldom, and contrary to common custom. Superfluous parts happen by the same cause that Twins and many at one birth, contrary to Natures course, do chance, that is, by a larger effusion of seed, than is required for the framing of that part, that so it exceeds either in number or else in greatness. So *Austin* tells that in his time in the East, an Infant was born, having all the parts from the belly upwards double, but from thence downward single and simple: for it had two heads, four eyes, two breasts, four hands, in all the rest like to another child, and it lived a little while. *Caelius Rhodiginus* saith he saw two Monsters in *Italy*, the one male, the other female, handsomely and neatly made through all their bodies, except their heads, which were double; the male died within a few days after it was born, but the female (whose shape is here delineated) lived five and twenty years, which is contrary to the common custom of Monsters; for they for the most part are very short-lived, because they both live and are born, as it were, against Natures consent; to which may be

be added, they do not love themselves, by reason they are made a scorn to others, and that by that means lead a hated life.

But it is most remarkable which *Lycosthenes* telleth of a * Woman-monster; for, excepting her two heads, she was framed in the rest of her body to an exact perfection: her two heads had the like desire to eat and drink, to sleep, to speak, and to do every thing; she begged from door to door, every one giving to her freely. Yet at length she was banished *Bavaria*, lest that by the frequent looking upon her, the imagination of Women with child, strongly moved, 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 *Italy*, two * Girls were born with their backs sticking together from the lower part of the shoulders unto the very buttocks. The novelty and strangeness of the thing moved their Parents, being but poor, to carry them through all the chief Towns in *Italy* to get money 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 be seen at *Paris*, out of whose belly another, perfect in all his members except head, hanged forth as if he had been grafted there. The man was forty years old, and he carried the other implanted or growing out of him, in his arms, with such admiration to the beholders, that many ran very earnestly to see him.

The

The Effigies of a horned or hooded Monster.

At *Quiers*, a small Village some ten miles from *Turin* in *Savoy*, in the Year 1578. upon the seventeenth day of *January*, about eight of the Clock at night, an honest Matron brought forth a Child having five horns, like to Rams horns, set opposite to one another upon his head: he had also a long piece of flesh, like in some sort to a French-hood which Women use to wear, hanging down from his forehead by the nape of his neck almost the length of his back: two other pieces of flesh, like the collar of a shirt, were wrapped about his neck: the fingers ends of both his hands somewhat resembled a Hawks Talons, and his knees seemed to be in his hams: the right leg and the right foot were of a very red colour; the rest of the body was of a tawny colour: it is said he gave so terrible a scritch when he was brought forth, that the Midwives, and the rest of the Women that were at her labour, were so frighted that they presently left the house and ran away. When the Duke of *Savoy* heard of this Monster, he commanded it should be 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 yielding a horrid representation of Snakes; the chin had three other Snakes stretched forth like a beard. It was first seen at *Autun*, at the house of one *Bancheron* a Lawyer: a Maid breaking many Eggs to butter, the white of this Egg given a Cat, presently killed her. Lastly, this Monster coming to the hands of the Baron *Seney*, was brought to King *Charles* the nineth being then at *Metz*.

** The shape of a Monster found in an Egg.*

The Effigies of a monstrous ♭ Child, having two heads, two arms, and four legs.

In the Year 1546. a Woman at *Paris* in her sixth Moneth of her account, brought forth a ♭ Child having two heads, two arms, and four legs. I dissecting the body 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 be one or more joined together, by the principal part: for if the body 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 *Tours* was delivered of * Twins joined together with one head, and naturally embracing each other. * *Renatus Ciretus* the famous Chirurgeon of those parts, sent me their *Sceleton.*

*The Portraiture of * Twins joined together with one Head.*

*The Effigies of two * Girls being Twins, joined together by their Fore-heads.*

Munster writes that in the Village *Brifsan*, not far from *Worms*, in the Year 1495. he saw two * Girls perfect and entire in every part of their bodies, but they had their Fore-heads so joined together that they could not be parted or severed by any art: they lived together ten years, then the one dying, it was needful to separate the living from the dead: but the did not long out-live her sister, by reason of the malignity of the wound made in parting them asunder.

In the Year of our Lord 1570. the twentieth of *July*, at *Paris* in the street *Gervillers*, at the sign of the Bell, these two Infants were born, differing in sex, with that shape of body 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 sirname *Petit Dieu* (i.) Little-God, his Mothers name was *Mathea Petronilla.*

The shape of the Infants lately born at Paris.

In the Year 1572. in *Pont de See* near *Angers*, a little Town, were born upon the tenth day of *July*, 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 breſt 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 belly.

The Figure of a Child with two heads, and the body as big as one of four moneths old.

Par. Hiſt. lib. 24. cap. 8. *Celius Rhodiginus* tells, that in a Town of his Countrey called *Sarzana*, *Italy* being troubled with Civil Wars, there was born a Monſter of unuſual bigneſs; for he had two heads, having all his limbs anſwerable in greatneſs and tallneſs to a Child of four Moneths 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 many arms.

Jovianus Pontanus tells in the Year 1529. the nineth day of *January*, there was a man-child born in *Germany*, having four arms, and as many legs.

The Figure of a man out of whoſe belly another head ſhewed it ſelf.

In the Year that *Francis* the firſt, King of *France*, entered into League with the *Swiſſers*, there was born a monſter in *Germany*, out of the midſt of whoſe belly there ſtood a great head; it came to mans age, and his lower, and as it were inſerted head, was nourished as much as the true and upper head.

In

The shape of two monstrous Twins, being but of one onely Sex.

In the Year 1572. the last day of *February*, in the Parish of *Vienhan*, in the way as you go from *Carnuta* to *Paris*, in a small Village called *Bordes*, one called *Cypriana Giranda* the Wife of *James Merchans* a Husbandman, brought forth this Monster whose shape you see here delineated, which lived until the Sunday following, being but of one onely Sex, which was the Female.

The shape of a Monstrous Pig.

In the Year 1572. on Easter Monday at *Metz* in *Lorain*, in the Inn whose Sign is the *Holy Ghost*, a Sow pigged a Pig which had eight Legs, four Ears, and the Head of a Dog; the hinder part from the belly 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 many in the lower. The Sex was not to be 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 me by *Borgesius* the famous Physician of *Metz*.

CHAP. III.

Of Women bringing many Children at one birth.

WOman is a Creature bringing usually but one at a birth: but there have been some who have brought forth two, some three, some four, some five, six, or more at one birth. *Empedocles* thought that the abundance of seed was the cause of such numerous births: the *Stoicks* affirm the divers Cells or Partitions of the Womb to be the cause; for the seed being variously parted into these Partitions, and the conception divided, there are more children brought forth; no otherwise than 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 Cells, as in Dogs and Sows, taketh no place; for Womens wombs have but one cavity, parted into two recesses, the right and left, nothing coming between, except by chance distinguished by a certain line; for often Twins lie in the same side of the Womb. *Aristotles* opinion is, that a Woman cannot bring forth more than five children at one birth. The Maid of *Augustus Cæsar* 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 Boys and two Girls. *Albucrasis* affirms a Woman to have been the Mother of seven children at one birth; and another, who by some external injury did abort, brought forth fifteen perfectly shaped in all their parts. *Pliny* reports that it was extant in the writings of Physicians, that twelve 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 *Siena*, 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 Family and Noble House called *Maldemeure*, the Wife of the Lord of *Maldemeure*, the first year she was married brought forth Twins, the second year she had three children, the third year four, the fourth year five, the fifth year six, and of that birth she died: of those six one is yet alive, and is Lord of *Maldemeure*. In the Valley of *Beaufort*, in the County of *Anjou*, a young Woman the daughter of *Macé Channiere*, when at one perfect birth she had brought forth one child, the tenth day following she fell in labour of another, but could not be delivered until 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.

The Picture of Dorothy *great with child with many children.*

The nineth Book of the Polish History.

Martin Comerus the Author of the *Polish* History, writeth that one *Margaret*, a woman sprung from a noble and ancient Family near *Cracovia*, and wife to Count *Virbestaus*, brought forth at one birth thirty five live children, upon the twentieth day of *January* in the Year 1296. *Franciscus Picus Mirandula* writeth, that one *Dorothy* an *Italian* had twenty children at two births; at the first nine and at the second eleven, and that she was so big, that she was forced to bear up her belly, which lay upon her knees, with a broad and large scarff tied about her neck, as you may see by this Figure.

And they are to be reprehended here again, who affirm the cause of numerous births to consist in the variety of the Cells of the Womb; for they feign a Womans Womb to have seven Cells or Partitions, three on the right side for Males, three on the left side for Females, and one in the midst for Hermaphrodites or Scrats: and this untruth hath gone so far, that there have been some that affirmed every of the seven Cells to have been divided into ten Partitions, into which the seed dispersed, doth bring forth a divers and numerous increase, according to the variety of Cells 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 eyes and senses.

Lib. 4. de Gen. anim. cap. 4.

The opinion of *Aristotle* is more probable, who saith Twins and more at one birth, are begot and brought forth by the same cause that the sixth finger groweth on the hand, that is, by the abundant plenty of the seed, which is greater and more copious than can be all taken up in the natural framing of one body; for if it all be forced into one, it maketh one with the parts increased more then is fit, either in greatness or number; but if it be, as it were, cloven into divers parts, it causeth more than one at one birth.

CHAP. IV.

Of Hermaphrodites, or Scrats.

AND here also we must speak of Hermaphrodites, because they draw the cause of their generation and conformation from the abundance of seed, and are called so, because they are of both Sexes, the Woman yielding as much seed as the Man. For hereupon it commeth to pass that the forming faculty (which always endeavours to produce something like it self) doth labour both the matters almost with equal force, and is the cause that one body is of both sexes.

Yet some make four differences of Hermaphrodites; the first of which is the male Hermaphrodite, who is a perfect and absolute male, and hath only a slit in the *Perinæum* not perforated, and from which neither Urin nor Seed doth flow. The second is the female, which besides her natural Privity, hath a fleshy and skinny similitude of a mans 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 making of water: the fourth difference is of those who are able in both sexes, and throughly perform the part of both man and woman, because 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 be found to have departed from the sex they made choice of; for some 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 Hermaphrodites are able in the male or female sex, or whether

whether they are impotent in both: these signs are most apparent in the Privities and Face; for if the matrix be exact in all its dimensions, and so perforated that it may admit a mans Yard, if the Courses flow that way, if the hair of the head be long, slender and soft, and to conclude, if to this tender habit of the body a timid and weak condition of the mind be added, the Female sex is predominant, and they are plainly to be judged Women. But if they have the *Perinæum* and fundament full of hairs, (the which in Women are commonly without any) if they have a yard of a convenient largeness, if it stand well and readily, and yield seed, the Male sex hath the preheminence, and they are to be judged men. But if the conformation of both the genitals, be alike in figure, quantity, and efficacy, it is thought to be 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 always perfect, the other imperfect. *Lib. 4. de gener. anim. cap. 5.*

The Figure of Hermaphrodite Twins cleaving together with their backs.

Anno Dom. 1486. in the Palatinate, at the Village *Rohach*, near *Heidelberg*, there were Twins, both Hermaphrodites, born with their backs sticking together.

The Effigies of an Hermaphrodite having four hands and feet.

The same day the *Venetians* and *Genoeses* entered into league, there was a Monster born in *Italy* having four arms and feet, and but one head; it lived a little after it was baptized. *James Ruef* a *Helvetian* Chirurgeon saith he saw the like, but which besides had the Privities of both sexes, whose figure I have therefore set forth, *Page* 590.

CHAP. V.

Of the changing of Sex.

A*Matus Lusitanus* reports 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 mans Yard, lying before that time hid and covered, so that of a Woman she became a Man, and therefore laying aside her Womans habit, was cloathed in mans, and changing her name, was called *Emanuel*; who when he had got much wealth by many and great negotiations and commerce in *India*, returned into his Country, and married a wife: but *Lusitanus* saith he did not certainly know whether he had any children, but that he was certain he remained always beardless.

Anthony Loqueneux, the Kings Keeper or Receiver of his Rents of St. *Quintin*, at *Vermandois*, lately affirmed to me that he saw a man at *Reims*, at the Inn having the sign of the *Swan*, in the Year 1560. who was taken for a Woman until the fourteenth year of his age; for then it happened as he played somewhat wantonly with a Maid which lay in the same bed with him, his members (hitherto lying hid) started forth and unfolded themselves: which when his Parents knew (by help of the Ecclesiastick power) they changed his name from *Joan* to *John*, and put him in mans apparel.

Some years agone, being in the Train of King *Charles* the Nineth, in the French Glass-house, I was shewed a man called *Germane Granierus*, but by some *Germane Maria* (because in former times when he was a Woman he was called *Marie*) he was of an indifferent stature, and well set body, with a thick and red beard; he was taken for a Girl until the fifteenth Year of his Age, because there was no sign of being a man seen in his body, and for that amongst Women, he in like attire did those things which appertain to Women: in the fifteenth year of his age, whilest he somewhat earnestly pursued Hogs given into his charge to be kept, who running into the Corn, he leaped violently over a ditch, whereby it came to pass that the stays and foldings being broken, his hidden members suddenly broke forth, but not without pain; going home, he weeping complained to

his Mother that his guts came forth: with which his Mother amazed, calling Physicians and Surgeons to counsel, heard he was turned into a man; therefore the whole business being brought to the Cardinal the Bishop of *Lemoncare*, an assembly being called, he received the name and habit of a man.

Pliny reports that the son of *Cassinus* of a Girl became a Boy, living with his Parents; but by the command of the Sooth-sayers he was carried into a Desart Isle, because they thought such Monsters did always shew or portend some monstrous thing. Certainly women have so many and like parts lying in their womb, as men have hanging forth; onely a strong and lively heat seems to be wanting, which may drive forth that which lies hid within: therefore in process of time the heat being increased and flourishing, and the humidity (which is predominant in child-hood) overcome, it is not impossible that the virile members, which hitherto sluggish by defect of heat, lay hid, may be put forth; especially if to that strength of the growing heat some vehement concussion or jactation of the body be joined. Therefore I think it manifest by these experiments and reasons, that it is not fabulous that some women have been changed into men: but you shall find in no history, men that have degenerated into women; for Nature always intends and goes 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 contrary, the seed be any thing deficient in quantity, for the conformation of the Infant or Infants, some one or more members will be wanting, or more short and decrepit. Hereupon it happens that Nature intending Twins, a Child is born with two heads, and but one arm, or altogether lame in the rest of his limbs.

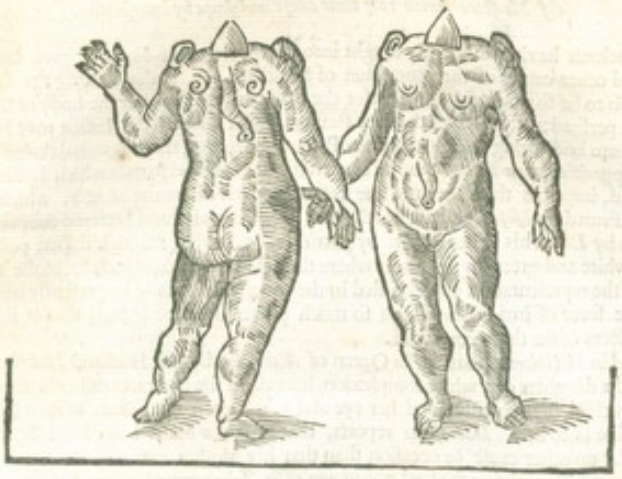
The Effigies of a monstrous child, by reason of the defect of the matter of Seed.

Anno Dom. 1573. I saw at St. *Andrews* Church in *Paris*, a Boy nine years old, born in the Village *Parpavilla*, six miles from *Guise*; his Fathers name was *Peter Renard*, and his Mother, *Marçuete:* he 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 fingers ends it was very deformed; he wanted his legs and thighs, although from the right buttock a certain unperfect Figure, having 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 mans Yard, as you may see by the Figure.

In the Year 1562. in the Calends of *November*, at *Villa Franca* in *Gascony*, this Monster, a headless woman, whose Figure hereafter follows, was born, which figure Dr. *John Altinus* the Physician gave to me, when I went about this Book of Monsters, he having received it from *Fontanus* the Physician of *Angolesme*, who seriously affirmed he saw it.

The

The Figure of a monstrous woman without a head, before and behind.



The Effigies of a man without arms, doing all that is usually done with hands.

The Effigies of a Monster with two heads, two legs, and but one arm.

A few years agone there was a man of forty years old to be seen at *Paris*, who although he wanted his arms, notwithstanding did indifferently perform all those things which are usually done with the hands; for with the top of his shoulder, head and neck, he would strike an Ax or Hatchet with as sure and strong a blow into a post, as any other man could do with his hand: and he would lash a Coachmans whip, that he would make it give a great crack, by the strong refraction of the air; but he eat, drank, plaid at Cards, and such like, with his feet. But at last he was taken for a Thief and Murderer, was hanged and fastned to a wheel.

Also not long ago there was a Woman at *Paris* without arms, which neverthelefs did cut, sew, and do many other things, as if she had her hands.

We read in *Hippocrates*, that *Attagias* his wife brought forth a child all of flesh without any bone, and notwithstanding it had all the parts well formed.

CHAP.

CHAP. VII.

Of Monsters which take their cause and shape by imagination.

The force of Imagination upon the body and humours.

THe Ancients having diligently sought into all the secrets of Nature, have marked and observed other causes of the generation of Monsters: for, understanding the force of imagination to be so powerful in us, as for the most part, it may alter the body of them that imagine, they soon perswaded themselves that the faculty which formeth the Infant may be 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 mind, imprints the force into the Infant conceived in the womb: which thing many think to be confirmed by *Moses*, because he tells that *Jacob* increased and bettered the part of the sheep granted to him by *Laban* his Wifes father, by putting rods, having 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 engendered, that the representation apprehended in the conception, should be presently impressed in the young; for the force of imagination hath so much power over the Infant, that it sets upon it the notes or characters of the thing conceived.

Gen. cap.30.

We have read in *Heliodorus*, that *Persia* Queen of *Æthiopia*, by her Husband *Hidaspes*, being also an Ethiope, had a daughter of a white complexion, because in the embraces of her husband, by which she proved with child, she earnestly fixed her eye and mind upon the picture of then fair *Andromeda* standing opposite unto her. *Damascene* reports, that he saw a Maid hairy like a Bear, which had that deformity by no other cause or occasion than that her Mother earnestly beheld in the very instant of receiving and conceiving the seed, the image of St. *John* covered with a Camels skin, hanging upon the posts of the bed.

They say *Hippocrates* by this explication of the causes, freed a certain Noble-woman from suspicion of adultery, who being white her self, and her husband also white, brought forth a child as black as an Ethiopian, because in copulation she strongly and continually had in her mind the picture of the Ethiope.

The Effigies of a Maid all hairy, and an Infant that was black by the imagination of their Parents.

There are some who think the Infant once formed in the Womb, which is done at the utmost within two and forty days after the conception, is in no danger of the Mothers imagination, neither of the seed of the Father which is cast into the Womb, because when it hath got a perfect figure, it cannot be altered with any external form of things; which whether it be true or no, is not here to be inquired of: truly I think it best to keep the woman all the time she goeth with child, from the sight of such shapes and figures.

In *Stequer* a Village of *Saxony*, they say, a Monster was born with four feet, eyes, mouth, and nose like a Calf, with a round and red excrescence of flesh on the fore-head, 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

The effigies of a horrid Monster, having feet, hands and other parts like a Calf.

The effigies of an Infant with a face like a Frog.

Anno Dom. 1517. in the Parish of *Kings-wood* in the Forest of *Biera*, in the way to *Fontainbleau*, there was a Monster born with the face of a Frog, being seen by *John Bellanger*, Chirurgeon to the Kings Engineers, before the Justices of the Town of *Harmoy*, principally *John Bribon* the Kings Procurator in that place. The Fathers name was *Amadæus the Little*, his Mothers *Magdalene Sarbucala*, who troubled with a Fever, by a Womans persuasion, held a quick Frog in her hand until it died; she came thus to bed with her husband and conceived: *Bellanger*, a man of an acute wit, thought this was the cause of the monstrous deformity of the child.

CHAP. VIII.

Of Monsters caused by the straitness of the Womb.

That the straitness or littleness of the womb may be the occasion of Monsters.

WE are constrained to confess by the event of things, that Monsters are bred and caused by the straitness of the Womb; for so Apples growing upon the Trees, if before they come to just ripeness they be put into strait Vessels, their growth is hindred. So some Whelps which Women take delight in, are hindred from any further growth by the littleness of the place in which they are kept. Who knows not that the Plants growing in the Earth, are hindred from a longer progress and propagation of their roots, by the opposition of a Flint, or any other solid body, and therefore in such places are crooked, slender and weak, but on the other part, where they have free nourishment, to be strait and strong? for seeing that by the opinion of Naturalists, the place is the form of the thing placed, it is necessary 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 causes of monstrous births: The too great or small matter of the seed, the corruption of the seed, and depravation of growth by the straitness or figure of the womb, which they thought the chiefest of all, because they thought the cause was such in natural births, as in forming of Metals and fusible things, of which Statues being made, do less express the things they be made for, if the molds or forms into which the matter is poured, be rough, scabrous, too strait, or otherwise faulty.

CHAP. IX.

Of Monsters caused by the ill placing of the Mother, in sitting, lying down, or any other fate of the body in the time of her being with child.

WE often too negligently and carelessly corrupt the benefits and corporal endowments of Nature in the comliness and dignity of conformation: it is a thing to be lamented and pitied in all, but especially in women with child, because that fault doth not onely hurt the Mother, but deforms and perverts the Infant which is contained in her womb: for we moving any manner of way, must necessarily move whatsoever is within us. Therefore they which sit idlely at home all the time of their being with Child, as cross-legged, those which

which holding their heads down, do sew or work with the needle, or do any other labour, which press the belly too hard with cloaths, breeches, and swathes, do produce children wry-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 child, who from the first conception, by the site of the Mother, had his hands and feet standing crooked.

CHAP. X.

Of Monsters caused by a stroke, fall, or the like occasion.

THere is no doubt but if any injury happen to a Woman with child, by reason of a stroke, fall from on high, or the like occasion, the hurt also may extend to the child. Therefore by these occasions the tender bones may be broken, wrested, strained, or depraved after some 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 caused by the vehement concussion of the whole body, by which means the child wants nourishment, and therefore will be small and little, and altogether monstrous.

CHAP. XI.

Of Monsters which have their original by reason of hereditary diseases.

BY the injury of hereditary diseases Infants grow monstrous, that is, monstrously deformed: for Crook-backed produce Crook-backed, and often-times so crooked, that between the bunch behind and before, the head lies hid, as a Tortoise in her shell: so Lame produce Lame, Flat-nosed their like, Dwarffs bring forth Dwarffs, Lean bring forth Lean, and Fat produce Fat.

CHAP.

CHAP. XII.

Of Monsters by the confusion of Seed of divers kinds.

THat which followeth is a horrid thing to be spoken; but the chaste mind of the Reader will give me pardon, and conceive that, which not onely the Stoicks, but all Philosophers, who are busied about the search of the causes of things must hold, That there is nothing obscene or filthy to be spoken. Those things that are accounted obscene may be spoken without blame, but they cannot be acted or perpetrated without great wickedness, fury and madness; therefore that ill which in obscurity consists not in word, but wholly in the act. Therefore in times past there have been some, who nothing fearing the Deity, neither the Law, nor themselves, that is, their soul, have so abjected and prostrated themselves, that they have thought themselves nothing different from Beasts: wherefore Atheists, Sodomites, Out-laws, forgetful of their own excellency and divinity, and transformed by filthy lust, have not doubted to have filthy 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 crafty, 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 kind, Monsters have been generated and born, who have been partly Men and partly Beasts.

The like deformity of issue is produced, if Beasts of a different species do copulate together, Nature always affecting to generate something which may be like it self: for Wheat grows 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 Sire, that is, the Dog. This Monster was sent to the Pope that then reigned, as *Volaterane* writeth: also *Cardane* mentions it; wherefore I have given you the Figure thereof. *Cardan. lib. 14. de var. rerum cap. 94.*

The Figure of a Monster in Face resembling a Man, but a Goat in his other Members.

Cælius Rhodiginus writes that at *Sibaris*, a Herdsman called *Chrathis* fell in love with a Goat, and accompanied with her, and of this detestable and brutish copulation an Infant was born, which in legs resembling the Dam, but the face was like the Fathers.

The

The Figure of a Pig, with a 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 body resembling a Swine.

Anno Dom. 1564. at *Bruxels* at the house of one *Joost Dillzpeert*, in the Street *Warmoesbroetls*, a Sow farrowed six Pigs, the first whereof was a Monster representing a Man in the Head, Face, Forefeet and Shoulders, but in the rest of the body another Pig, for it had the genitals of a Sow-pig, and it sucked like other Pigs: but the second day 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.

Anno Dom. 1571. at *Antwerp*, the wife of one *Michael* a Printer, dwelling with one *John Molline* a Graver or Carver, at the Sign of the Golden Foot in the *Camistrate*, on S. *Thomas* his day, 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 any Feathers on it. This Monster was not alive, for that the Mother was delivered before her time; but she giving a great scritch in the instant of her deliverance the Chimney of the house fell down, yet hurt no body, no not so much as any 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.

The

The Figure of a three-headed Lamb.

Lewis Gellius writeth that he hath read in an approved Author, that an Ewe once brought forth a Lion, a Beast of an unlike and adverse nature to her.

An. Dom. 1577. in the Town of *Elandy* three miles from *Melon*, there was lambed a Lamb having three heads, the middlemost of which was bigger than the rest; when one bleated they all bleated. *John Bellanger* the Chirurgeon of *Melo* affirmed that he saw this Monster, and got it drawn, and sent the figure thereof to me with that humane Monster that had the head of Frog, which we have formerly described.

There are some Monsters in whose generation by this there may seem to be some divine cause, for that their beginnings cannot be derived or drawn from the general cause of Monsters; that is, Nature, or the errours thereof, by reason of some of the fore-mentioned particular causes: such are these Monsters that are wholly against all Nature, like that which we formerly mentioned of a Lion yeaned by an Ewe.

Yet Astrologers (lest there should seem to be any thing which they are ignorant of) refer the causes of these to certain constellations and aspects of the Planets and Stars, according to *Aristotles* 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 Townsmen apprehended the Herdsman, and condemned him as guilty of such a crime, to be 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 Astrology, that it was not occasioned by any humane wickedness, but by the efficacy of a certain position of the Stars that this Monster was born.

CHAP. XIII.

Of Monsters occasioned by the craft and subtilty of the Devil.

IN treating of such Monsters as are occasioned by the craft of the Devil, we crave pardon of the courteous Reader, if peradventure going further from our purpose, we may seem to speak more freely and largely of the Existence, Nature, and Kinds 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 themselves: for none can be admitted into that Society 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 he hath obliged himself. And assuredly, whosoever addicts himself to these Magical vanities and Witchcrafts, doth it either because he doubts of Gods Power, Promises, steady and great Good Will towards us: or else for that he is madded with an earnest desire of knowing things to come; or else because disdaining poverty, he affects and desires from a poor estate to become rich on the sudden. It is the constant opinion of all, both Ancient and Modern, as well Philosophers as Divines, that there are some such men; which when they have once addicted themselves to impious and devillish Arts, can by the wondrous craft of the Devil, do many 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 against those things which neither ever have been, nor ever came into the knowledge of men: for such things are rightly judged and accounted for impossibilities, which have never been seen or heard of.

There are Sorcerers, and how they come so to be.

What inticeth them thereto.

Before the birth of Christ there have been many such People; for you may find 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 *Oebasias* by his Prophet, for that he turned unto these kind of people. We are taught by the Scriptures that there are good and evil spirits, and that the former are termed Angels, but the latter Devils; for the Law is also said to be given by the Ministry of Angels: and it is said that our bodies should rise again at the sound of a Trumpet, and at the voice of an Arch-Angel. Christ said that God would send his Angels to receive the Elect into the Heavens.

Exod. cap. 22. *Levit.* cap. 19.

Heb. 1. 14. *Col.* 3. 19. 1 *Thess.* 4. 16.

The History of *Job* testifieth that the Devil sent fire from Heaven, and killed his Sheep and Cattel, and raised winds that shook the four corners of the house, and overwhelmed his children in the ruines thereof. The History of *Achab* mentioneth a certain lying spirit in the mouth of the false Prophets. Satan entring into *Judas* moved him to betray Christ. Devils who in a great number

Job 83. *Mat.* 16 94.

ber possessed the body of a man, were called and obtained of Christ that they might enter into Swine, whom they carried headlong into the Sea.

In the beginning God created a great number of Angels, that those divine and incorporeal spirits might inhabit Heaven, and as Messengers, signifie Gods pleasure to men, and as Ministers or Servants, perform his commands, who might be as Over-seers, and Protectors of humane affairs. Yet of this great number there were some who were blinded by pride, and thereby also cast down from the presence, and heavenly habitation of God the Creator. These harmful and crafty spirits delude mens minds by divers jugling tricks, and are always contriving something to our harm, and would in a short space destroy mankind, but that God restrains their fury; for they can onely do so much as is permitted them: Expelled Heaven, some of them inhabit the Air, others the bowels of the Earth; there to remain till God shall come to judge the World: and as you see the Clouds in the Air somewhiles to resemble Centaurs, otherwhiles Serpents, Rocks, Towers, Men, Birds, Fishes, and other shapes: so these spirits turn themselves into all the shapes and wondrous forms of things; as oft-times into wild Beasts, into Serpents, Toads, Owls, Lapwings, Crows or Ravens, Goats, Asses, Dogs, Cats, Wolves, Bulls, 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 themselves into Angels of Light.

The Power of evil spirits over mankind. The differences of Devils.

The delusions of Devils.

They feign themselves to be 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 we read that God sent evil Angels into *Egypt*, there to destroy. They howl in the night, they murmur and rattle as if they were bound in chains, they move Benches, Tables, Counters, Props, Cupbords, Children in the Cradles, play at Tables and Chess, turn over Books, tell Money, walk up and down Rooms and are heard to laugh, to open Windows and Doors, cast sounding Vessels, as Brass and the like, upon the ground, break Stone-pots and Glasses, and make other the like noises. Yet none of all these things appear to us when we arise in the morning, neither find we any thing out of its place or broken. They are called by several names, as Devils, Evil spirits, *Incubi*, *Succubi*, Hobgoblins, Fairies, Robin-good-fellows, Evil angels, Sathan, Lucifer, the Father of Lies, Prince of Darkness, and of the World, Legion, and other names agreeable to their Offices and Natures.

Their Titles and Names.

CHAP. XIV.

Of the subterrene Devils, and such as haunt Mines.

What the Devils in Mines do.

LEwis Lavater writes, that by the certain report of such as work in Mines, that in some 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 notwithstanding they do nothing indeed. But in the mean time they hurt none of the by-standers, unless they be provoked thereto by words or laughter: for then they will throw some heavy or hard thing upon him that hurt them, or injure them some other way.

The same Author affirms that there is a silver Mine in *Rhetia*, out of which *Peter Briot*, the Governour of the place, did in his time get much Silver. In this Mine there was a Devil, who chiefly on Friday, 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 he lifted, out of one Tub into another. It happened one day that he was more busie than he used to be, so that one of the Miners reviled him, and bad him be gone on a vengeance to the punishment appointed for him. The Devil offended with this imprecation and scoff, so wrested the Miner, taking him by the head, twining his neck about, he set his face behind him, yet was not the Workman killed therewith, but lived, and was known by divers for many years after.

CHAP. XV.

By what means the Devils may deceive us.

Devils are Spirits.

OUr minds involved in the earthy habitation of our bodies, may be deluded by the Devils divers ways: for they excel in purity and subtilty of essence, and in the much use of things: besides, they challenge a great preheminence, as the Princes of this World, over all sublunary bodies. Wherefore it is no marvel if they, the Teachers and Parents of Lies, should cast clouds and mists before our Eyes from the beginning, and turn themselves into a thousand shapes of things and bodies, that by these juglings and tricks they may shadow and darken mens minds.

CHAP. XVI.

Of Succubi *and* Incubi.

The reason of the name. *Lib.15. de civ. Dei, cap. 22, & 23.*

POwerful by these fore-mentioned Arts and Deceits, they have sundry times accompanied with men in copulation, whereupon such as have had to do with men, were called *Succubi*; those which made use of Women, *Incubi*. Verily St. *Augustine* seemeth not to be altogether against it, but that they, taking 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 unwary, by the flames of Lust, from Vertue and Chastity.

An History.

John Ruffe, in his Book of the Conception and Generation of Man, writes that in his time, a certain

certain Woman of monstrous lust, and wondrous imprudency, had to do by night with a Devil that turned himself into a man, and that her belly swelled up presently after the act, and when as she thought she was with child, she fell into so grievous a disease, that she voided all her entrails by stool, Medicins nothing at all prevailing.

An History. The like History is told of a servant of a certain Butcher, who thinking too attentively on Venerous matters, a Devil appeared to him in the shape of a Woman, with whom (supposing it to be a Woman) when as he had to do, his genitals so burned after the act, that becoming inflamed he 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 Womans womb seed taken from some man either dead or alive. Yet this opinion is most absurd and full of falsity, mans seed consisting of a seminal or sanguinous matter, and much spirit: if it run otherwise into the womb than from the testicles, and stay never so little a while, it loseth its strength and efficacy, the heat and spirits vanishing away; for even the too great length of a mans yard is reckoned amongst the causes of barrenness, by reason that the seed is cooled by the length of the way. If any in copulation, after the ejaculation of the seed, presently draw themselves from the Womans embraces, they are thought not to generate, by reason of the air entering into the yet open womb, which is thought to corrupt the seed. By which it appears how false that History in *Averrois* is, of a certain Woman that said she conceived with child by a mans seed shed in a Bath, and so drawn into her womb, she entering the Bath presently after his departure forth. It is much less credible that Devils can copulate with Women, for they are of an absolute spirituous Nature; but bloud and flesh are necessary for the generation of man. What natural reason can allow that the incorporeal Devils can love corporeal Women? And how can we think that they can generate, who want the instruments of generation? How can they who neither eat nor drink be said to swell with seed? Now where the propagation of the species is not necessary to be supplied by the succession of individuals, Nature hath given no desire to Venery, neither hath it imparted the use of generation; but the Devils once created were made immortal by Gods appointment: If the faculty of generation should be granted to Devils, long since all places had been full of them. Wherefore if at any time Women with child by the familiarity of the Devil, seem to travel, we must think it happens by those Arts we mentioned in the former Chapter, to wit, they use to stuff up the bodies of living Women with cold clouts, bones, pieces of iron, thorns, twisted hairs, pieces of wood, Serpents, and a world of such trumpery, wholly dissenting from a Womans nature: who afterwards, the time, as it were, of their delivery drawing nigh, through the womb of her that was falsly judged with child, before the blinded, and, as it were bound up eyes of the by-standing women, they give vent to their impostures. The following History, recorded in the Writings of many most credible Authors, may give credit thereto.

Averrois his History convict of falsehood.

The illusions of the Devil.

An History. There was at *Constance* a fair Damosel called *Margaret*, who served a wealthy Citizen: she gave it out every where that she was with child by lying with a Devil on a certain night. Wherefore the Magistrates thought it fit she should be kept in Prison, that it might be apparent both to them and others, what the end of this exploit would be. The time of deliverance approaching, she felt pains like those which Women indure in travail; at length, after many throws, by the Midwives help, in stead of a child, she brought forth iron nails, pieces of wood, of glass, bones, stones, hairs, tow, and the like things, as much different from each others 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.

Our sins are the cause that the Devils abuse us. 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 mankind. But that an humane birth may thence arise, it not onely affirms to be false, but detests as impious, as which believes that there was never any man begot without the seed of man, our Saviour Christ excepted. Now what confusion and perturbation of Creatures should possess this world (as *Cassianus* saith) if Devils could conceive by copulation with men? or if Women should prove with child by accompanying them, how many Monsters would the Devils have brought forth from the beginning of the world? how many Prodigies by casting their seed into the wombs of wild and brute Beasts? for by the opinion of Philosophers, as often as Faculty and Will concur, the effect must necessarily follow: now the Devils never have wanted will to disturb mankind, and the order of this World; for the Devil as they say, is our common enemy from the beginning; and as God is the author of order, and beauty, so the Devil, by Pride, contrary to God, is the causer of confusion and wickedness.

Wherefore if power should accrew equal to his evil mind and nature, and his infinite desire of mischief and envy; who can doubt but a great confusion of all things and species, and also great deformity would invade the decent and comely order of this Universe, Monsters arising on every side: But seeing that Devils are incorporeal, what reason can induce us to believe that they can be delighted with venerous actions: and what will can there be whereas there is no delight, nor any decay of the species to be feared? seeing that by Gods 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 mind 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 History of certain Diseases, and remedies supernatural, and wholly magical out of *Fernelius*. There are Diseases, which as they are sent amongst men by God being offended, so they cannot expect cure otherwise than from God, from whence 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 with the Pestilence, killed sixty odd thousand persons.

Lib. 2. de ab. it. caus. cap. 16.

Witches hurt by the Devils assistance.

Thus *Hezeckias* was struck with a grievous disease: *Job* was defiled with filthy Ulcers by *Satan* at Gods command. And as the Devil, the cruel enemy of mankind, commonly useth by Gods permission to afflict those: so wicked persons by the wondrous subtilty of the Devil, offer violence and do harm to many. Some invoke I know not what Spirits, and adjure them with Herbs, Exorcisms, Imprecations, Incantations, Charms: and others hang about their necks, or otherwise carry certain Writings, Characters, Rings, Images, and other such impious stuff. Some use Songs, Sounds, or Numbers: sometimes Potions, Perfumes, and Smells; sometimes Gestures and Jugling. There be some that make the portraiture of the absent Party in Wax, and boast that they can cause or bring a disease into whatsoever part thereof they prick, by the force of their Words and Stars, into the like part of the party absent; and they have no few other tricks to bring other diseases.

We know for certain that Magicians, Witches, and Conjurers, have by charms so bound some 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 mans body, but also Devils themselves. These truly are soon distracted with a certain Fury, but in this one thing they differ from simple Madness, for that they speak things of great difficulty, tell things past and hid, disclose the secrets of such as are present, and revile them many ways, and are terrified, tremble and grow angry by the power of divine words.

An History.

One not very long agon, being by reason of heat exceeding drie in the night-time, rising out of his sleep, and not finding drink, took an apple that he found by chance, and eating it he thought his jaws were shut and held fast as by ones hands, and that he was almost strangled: and also now possessed of a Devil entering into him, he seemed in the dark to be devoured of a huge exceeding black Dog, which he, afterwards restored to his former health, orderly related to me. There were divers who by his pulse, heat and the roughness of his tongue, thought him to be in a Fever, and by his watching, and the perturbation of his mind, thought him onely to rave.

An History.

Another young Noble man, some few years since, was troubled at set times with a shaking of the body, and as it were a Convulsion, wherewith one while he would move onely his left arm, another while the right arm; and also sometimes but one finger onely, somewhiles but one leg, sometimes the other, and at other times the whole trunk of his body, with such force and agility, that lying in his bed, he could scarce be held by four men; his head lay without any shaking, his tongue and speech was free, his understanding sound, and all his senses perfect even in the height of his fit. He was taken at the least ten times a day, well in spaces between, but wearied with labour: it might have been judged a true Epilepsie, if the understanding and senses had failed.

The most judicious Physicians who were called to him, judged it a Convulsion, cousin-german to the Falling-sickness, proceeding from a malign and venomous vapour impact in the spine of the Back, whence a vapour dispersed it self over all the Nerves, which pass from the spine every way into the Limbs, but not into the Brain. To remove this, which they judged the cause, frequent Clysters are ordained, and strong Purges of all sorts, Cupping-glasses are applied to the beginnings of the Nerves, Fomentations, Unctions, Emplasters, first to discuss, then to strengthen and wear away the malign quality: These things doing little good, he was sweated with Baths, Stoves, and a Decoction of *Guaiacum*, which did no more good than the former, for that we were all far from the knowledge of the true cause of his Disease: for in the third moneth, a certain Devil was found to be the Author 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:) he laid open many Secrets of the By-standers, and chiefly of the Physicians, deriding them for that he had abused them to the Patients great harm, because they had brought his body so low by needless Purgations.

The Devil shews himself by speaking of Greek.

When his Father came to visit him, he would cry out long before he 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 holy and divine things were read before him, he shook and trembled more violently. When his Fit was over, he remembred all that was done, and affirmed he did it against his will, and that he was sorry for it. The Devil, forced by Ceremonies and Exorcisms, denied that he was damned for any crime, and said that he was a spirit: being asked who he was, and by what means and power he did these things, he said that he had many habitations into which he could betake himself, and in the time of his rest, he could torment others: that he was cast into this body by a certain person whom he would not name, and that he entered by his feet up to his neck, and that he would go forth again the same way, when as his appointed time was come. He spoke of sundry other things, as others which are possessed use to do.

Devils wax angry, and are terrified by divine things.

Now I speak not these things as new or strange, but that it may appear that Devils sometimes entering into the body, do some whiles torment it by diverse and uncouth ways; other whiles they

they do not enter in, but either agitate the good humours of the body, or draw the ill into the principal parts, or with them obstruct the veins or other passages, or change the structure of the instruments, from which causes innumerable diseases proceed: of these, Devils are the authors, and wretched and forlorn persons the Ministers: and the reason of these things is beyond the search of Nature.

Pliny tells that the Emperour *Nero* in his time found magical arts most vain and false: but what need we alledge profane Writers, when as those things that are recorded in Scripture of the Pythonisse, of the Woman speaking in her belly, of King *Nebuchodonozor*, of the Magicians of *Pharaoh*, and other such things not a few, prove that there both is, and hath been Magick. *Pliny* tells of *Demochus*, that he tasting of the entrails of a sacrificed child, turned himself into a Wolf. We read in *Homer* that *Circe* 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 be spoiled or carried away by inchantments: which things, unless they were approved and witnessed by many mens credits, the wisdom of Magistrates and Lawyers, would not have made so many Laws against Magicians, neither would there have been a mulct imposed upon their heads by the Law of the Twelve Tables, who had inchanted other mens Corn. But as in magical Arts the Devil doth not exhibit things themselves, as those which he cannot make, but onely certain shews or appearances of things: so in these which are any ways accommodated to the use of Physick, the Cure is neither certain nor safe, but deceitful, captious, and dangerous.

It is but a deceitful cure that is performed by the Devil.

I have seen the Jaundice over the whole body, 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 worse. Now there are some vain things, and verily the fansies of old Women, which because they have long possessed the minds of men, weakened with too much superstition, we term them superstitious. These are such as we 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 Medicins beyond Nature, and which are consequently to be used to Diseases, whose essences are supernatural, must proceed. Such like old Wives Medicins and superstitious 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 Medicin to heal the Falling-sickness, to carry in writing the name of the three Kings, *Gaspar*, *Melchior*, and *Balthasar*, who came to worship Christ? To help the Tooth-ach, if one whilest Mass is saying, touch his teeth, saying these words, *Os non comminuitis ex eo?* To stay Vomiting with certain Ceremonies and words, which they absent pronounce, thinking it sufficient if that they but onely know the Patients name?

Old Wives superstitious Medicins 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 be some who to that purpose say this, *De latere ejus exivit sanguis & aqua.* How many Prayers or Charms are carried about to cure Agues? some taking hold of the Patients hand, say, *Æque 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 he is stung by a Scorpion, they say that the danger is immediately over.

As there are many superstitious words, so there are many superstitious writings also. To help sore Eyes, a Paper wherein the the two Greek Letters Γ and Α are written, must be tied in a thred, and hanged about the neck. And for the Tooth-ach this ridiculous saying, *Strigiles facilisque dentate, dentium dolorem persanate.* Also oft-times there is no small superstition in things that are outwardly applied. Such is that of *Apollonius* in *Pliny*, to scarifie the Gums in the Tooth-ach, with the tooth of one that died a violent death: to make Pills of the skull of one hanged, against the bitings of a mad Dog: to cure the Falling-sickness by eating the flesh of a wild Beast killed with the same iron wherewith a man was killed: that he shall be freed from a Quartan Ague who shall drink the Wine whereinto the Sword that hath cut off a mans head, shall be put; and he, the parings of whose nails shall be 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 be assuaged, if a Beasts Milt be laid upon it, and the Physician say that he cures or makes a Medicin for the Milt. Any one to be freed 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 Semi-tertians. What truth can be in that which sundry affirm, that a leaf of *Lathyris*, which is a kind of Spurge, if it be plucked upwards, will cause vomit, but broken downwards will move to Stool? You may also find many other superstitious fictions concerning herbs, such as *Galen* reports 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 be everywhere found such wicked persons, who leaving the Arts and Means which are appointed by God to preserve the health of Mans body, fly to the superstitious and ridiculous remedies of Sorcerers, or rather of Devils, which notwithstanding the Devil sometimes makes to perform their wished for effects, that so he may still keep them ensnared and addicted to his service. Neither is it to be approved which many say, that it is good to be healed by any Art or Means, for that healing is a good work. This saying is unworthy of a Christian, and savours rather of him that trusts more to the Devil than in God. Those Empericks are not of the Society of Sorcerers and Magicians, who heal simple wounds with dry lint, or lint dipt 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 taking away the impedi-

ments, that is pain, defluxions, inflammation, an abscess and gangrene, which retard and hinder the cure of such diseases. The following examples will sufficiently make evident the Devils maliciousness, always wickedly and craftily plotting against our safety and life.

Lib. epist. 38. ep. A certain Woman of *Florence* (as *Langius* writes) having a malign ulcer, and being troubled with intolerable pain at the stomach, so that the Physicians could give her no ease: behold on a sudden she 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*, exceeds all credit, unless there were Eye-witnesses of approved integrity yet living. In this Town one *Ulrich Nusesser*, an Husbandman, was tormented with grievous pain in the one side of his belly; he suddenly got hold of a iron Key with his hand under the skin, which was not hurt, the which the Barber-Surgeon of the place cut out with a Razor; yet for all this the pain ceased not, but he grew every day worse than other: wherefore expecting no other remedy but death, he got a Knife and cut his throat. His dead body 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 exceedeth 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 the Devil. Thus far *Langius*.

CHAP. XVIII.

Of the Cozenages and crafty Tricks of Beggars.

HAving treated of Monsters, it follows that we speak of those things which either of themselves, by reason of their nature full of admiration, have some kind of monstrousness in them, or else from some other ways, as by the craft and cozenage of men. And because to the last mentioned crafts of the Devil, the subtle devices of begging Companions are somewhat alike, therefore I will handle them in the next place, that the Surgeon being admonished of them, may be more cautious and cunning in discerning them when he meets with them.

An history of a counterfeit arm.

Anno Dom. 1525. when I was at *Anjou*, there stood a crafty Beggar begging at the Church door, who tying and hiding his own arm behind his back, shewed in stead thereof, one cut from the body of one that was hanged, and this he propped up and bound to his brest, and so laid it open to view, as if it had been all enflamed, so to move such as passed by, unto greater commiseration of him. The cozenage lay hid, every one giving him money, until at length his counterfeit arm not being surely fastned, fell upon the ground, many seeing and observing it; he being apprehended and laid in prison, by the appointment of the Magistrate was whipped through the Town, with his false arm hanging before him, and so banished.

Another of a cancrous breast.

I had a brother called *John Parey*, a Surgeon, who dwelt in *Vitre* in *Britain*; he 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 he had more diligently beheld the womans face, and the fresh colour thereof, as also of the places about the ulcer, and the good habit of the whole body agreeable to that colour (for she was somewhat fat, and of a very good habit of body) he was easily hereby induced to suspect some roguery and deceit. He acquainted the Magistrate with this his suspicion, and got leave that he might carry her home to his house, so to search her more narrowly. Where opening her breast, he found under her arm-pit, a Sponge moistned with a commixture of beasts bloud and milk, and carried through an Elder-pipe to the hidden holes of her counterfeit *Cancer*. Therefore he foments 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 Flour; and these being thus fetched off, he found her breast perfectly sound.

The Beggar being cast for this into prison, confessed that she 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 fore-mentioned liquor might drop out, counterfeited an Ulcer of a monstrous bigness and malignity, covering the edges of the Milt on every side with a filthy cloth. This Beggar was diligently enquired after, but could not be found; and so she was whipped and banished.

Of one feigning himself leprous.

* Cliquets are things made somewhat 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.

Within less than a year after, there came into the same City a notable crafty Companion, who presently taking up the Church-doors, laid open his Wares; to wit, a Kercher with some small pieces of money lying thereon, a wooden Barrel, and *Cliquets, where-with he would ever now and then make a great noise: his face was spread over with great thick pustles, being of a blackish red colour, and made with Glue like those that have the Leprosie: this his ghastly look made him to be pitied by all men, which was the cause that every one gave him money. Then my brother came somewhat nearer him, and asked him how long he had been troubled with this so cruel Disease; he answered with an obscure and hoarse voice, that he was born a Leper from his Mothers Womb, and that his Parents both died of this wicked Disease, so that their members fell away by piece-meal. Now he had a woollen swathe about his chaps, wherewith (having his left hand under his Cloak) he so straitned his chaps, that much black bloud rose into his face, and made him so hoarse that he could scarce speak; yet he could not contain himself, but that in speaking he ever now and then slackned the swathe with his hand, the freelier to draw his breath; which when my brother had observed, suspecting some cozenage, he obtained leave of the Magistrate to search and examine the man, whether he were truly leprous, or no. First therefore he 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 natu-

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ral colour and shape. Then he 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, he made him to be put in prison, and to be thrice whipped through the Streets of the City, with his Barrel hanging before him, and his Cliquets behind him, adding thereto the punishment of perpetual banishment. It happened that as he was whipped the third Market-day, the People cried out to the Hangman in jest, that he should not fear to lash him soundly, for being leprous he could not feel it; the Executioner incited by this cry of the People, did so belabour him, that the Wretch died of his Whipping within a short while after, having a just reward for his wickedness. For these Impostors, besides that they live like drones, feigning this or that Disease, and so being idle, enjoy the fruits of others labours: they also divers times conspiring together, take away the lives and goods of honest and substantial Citizens and other people: for there are some of them that in an evening, as men that have no habitation, desire lodging for a night, and it being granted them, they, when as the Master of the house and his Family are asleep, open the doors to their Comrades, men as wicked as themselves, and kill and carry away all they can.

A multitude of Beggars hurtful to the City.

Certainly we may justly affirm, that this crafty way of begging is the Mother and School of all dishonesty: for how many acts of bawdry and poisoning every where corrupt the Wells and publick Fountains? How many 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 Villany, than out of the crew of these Beggars?

How to discover such as counterfeit the Jaundice.

Some of them there are, who besmear their faces with soot laid in water, so to seem to have the Jaundice. But you may at the first sight find out the deceit, by the native whiteness of the outer coat of the eye, called *Adnata*, which in such as truly have the Jaundice, useth to be died and overcast with a yellowish colour; also you may be 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 colour shew it self.

Some there be, who not content to have mangled, and filthily exulcerated their limbs with caustick herbs, and other cauteries; or to have made their bodies more swollen, or else lean, with medicated drinks; or to have deformed themselves some other way, but from good and honest Citizens, who have charitably relieved them, they have stollen their children, have broken or dislocated their arms and legs, have cut out their tongues, have depressed the cheft or whole breast; that with these as their own children, begging up and down the Countrey, they may get the more relief, pitifully complaining that they came by this mischance by Thunder or Lightning, or some other strange accident.

Lastly, They part the Kingdom amongst themselves as into Provinces, and communicate by Letters one to another, what news or new quaint devices there are to conceal or advance their Roguery: to which purpose they have invented a new Language onely known to themselves, so to discourse together, and not to be understood by others. [We here vulgarly term it *Canting*.]

Of one counterfeiting the falling of the Fundament.

Dr. *Fleetle*, a Physician of *Paris*, intreated me to bear him company to his Country-house at *Champigny*, four miles from *Paris*. Where as soon as we arrived, and were walking in the Court, there came presently to us a good lusty well flesht manly woman, begging alms for St. *Fiacre* sake, and taking up her Coat and her Smock, she shewed a great gut hanging down some 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 filthy to look upon. *Fleetle* asked how long she had been troubled with this Disease; she answered that it was four years since she first had it. Hence he easily gathered that she played the counterfeit: for it was not likely that such abundance of purulent matter came forth of the body of so well flesht and coloured a Woman; for she would rather have been very lean and in a consumption. Wherefore provoked with just anger, by reason of the wickedness of the deceit, he run upon her and threw her down upon the ground, and trod her under his feet, and hit her divers blows upon the belly, so that he made the gut which hung at her, to come 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, she put the one of them into her fundament, and let the filth flow forth at very little holes.

Of one feigning the falling down of the Womb.

Not very long ago, a Woman equally as shameless, offered her self to the Overseers of the Poor of *Paris*, intreating that she might be entered for one of their Pensioners, for that her Womb was fallen down by a dangerous and difficult birth, wherefore she was unable to work for her living. Then they commanded that she should be tried and examined, according to the custom, by the Surgeons which are therefore appointed: who seeing how the whole business was carried, made report she was a Counterfeit, for she had thrust an Oxes bladder, half blown and besmeared with beastly bloud by the neck, whereto she had fastned a little Sponge, into the neck of her Womb, for the Sponge being filled and swollen up by the accustomed moisture of the Womb, so held up the Oxes bladder that hanged thereat, that she might safely go without any fear of the falling of it out, neither could it be pulled forth but with good force. For this her device she was put into Prison, and being first whipped, was after banished. This cozenage is not much unlike theirs, who by fitly applying a Sheeps paunch to their groin, counterfeit themselves to be burften.

Of a Beggar that feigned her self to have a Snake in her belly.

Anno Dom. 1561. there came to *Paris* a lusty, stout, and very fat *Norman* Woman, being about some thirty years old, who begging from door to door, did cast to meet with rich Women, and very familiarly and pitifully would relate unto them her misfortune, saying, she had a Snake in her Belly, which crept in at her mouth as she slept in a Hemp-land: she would let one feel her stir, by putting their hand to her Belly, adding also that she was troubled day and night with its uncessant gnawing of her guts. The novelty of this sad chance, moved all to pity and admiration; wherefore as much as they could, they assisted her with means and counsel. Amongst the rest, there was

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a Woman of great devotion and charity, who sending for Doctor *Hollerius Chevall* and me, asked us if this Snake could by any means be gotten forth. *Hollerius* gave her a strong purgation, hoping that by stirring up the expulsive faculty, the Serpent might be cast forth together with the noxious humours. But this hope had no such success. Wherefore when as we met again, we thought it fit to put a *Speculum matricis* into the neck of her womb, so to see if we could discern either head or tail: but I making large dilatation of her Womb, could see no such thing; onely we observed a certain voluntary motion, whereof she her self was the author, by contracting and dilating the muscles of the lower belly. Which when as we had observed, perceiving the deceit and imposture, we thought good so to terrifie her, and make her confess the deceit, to tell her that she must take another, but that a more strong purgation; that what we could not do by the former, as more gentle, we might attain to by the latter, as far stronger. She dissembling all fear, and conscious of her craft and dissimulation, after we were gone in the evening, packing up her stuff, and a great deal more then her own, she 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 days after, sitting lustily upon a Pack-horse, at the Gate *Montmartre*, and laughing heartily with such as brought Sea-fish to Town: and she was returning (as it was most likely) into her Countrey, seeing her coznenage was discovered here.

The craft of such as feign themselves to have the Falling-sickness.

Such as feign themselves dumb, draw back and double their tongues in their mouths. Such as falling down counterfeit the Falling-sickness, bind straitly both their wrists with plates of iron, tumble and rowl themselves in the mire, sprinkle and defile their heads and faces with Beasts bloud, and shake their limbs and whole body. Lastly, by putting Soap into their mouths, they foam at the mouth like those that have the Falling-sickness. Othersome with Flour make a kind of Glue, wherewith they besmear their whole bodies, as if they had that Leprosie or Scab that is vulgarly termed *Malum sancti Maris*. Neither must we think this Art of Counterfeiting and cheating Begging to be new, and of late invention; for long ago it flourished in *Asia*, even in the time of *Hippocrates*, as may appear in his Book *De Aere, Locis, & Aquis*. But by how much this disease hath taken more deep root, and grown more inveterate by process of time, by so much it must more diligently and carefully be looked to and prevented, by cruelly punishing such Counterfeits: for that by this feigned begging, as the Nourisher of Sloth, and Shop of all dishonesty, that which is taken from the good is bestowed upon the ill, and one wicked and counterfeit Beggar hurts all other wretched people.

Of such as feign themselves leprous.

CHAP. XIX.

Of strange or monstrous accidents in Diseases.

Monsters happen also in diseases.

WHat monstrousness soever was in the last mentioned parties, it was made up by the craft of Beggars for filthy gain. But if there be any monstrousness in the following narrations, it is of Nature, but working as it were miraculously, by some secret and occult means; for thus there are oftentimes Monsters in Diseases. Before the Town of St. *John de Angely*, a Souldier called *Francis*, of the Company of Captain *Muret*, was wounded with a Harquebuz-shot on the belly, between his navel and sides; the bullet was not taken out, because the Surgeons who searched him diligently, could not find it: wherefore he was troubled with grievous and tormenting pains, until the nineth day after he received the wound, the bullet came forth at his fundament: wherefore within three weeks after he was perfectly whole. He was healed by *Simon Crinay*, the Surgeon of the *French* Companies.

A bullet shot into the belly came forth at the Fundament.

A bullet sticking in the throat and the Patient recovering.

James Pope, Lord of St. *Albans* in *Dauphine*, was wounded at the Skirmish at *Chasseray*, having three Harquebuz bullets entering into his body, one whereof pierced under his throat, where it buncheth out as with a knot, near to the pipe of his lungs, even to the beginning of the *Vertebræ* of the neck, in which place the Leaden bullet stuck, and as yet doth remain. Hereupon he was afflicted with many and fearful symptoms, as a Fever, and a great swelling of his whole neck, so that for ten whole days he could swallow nothing but broths and liquid things. Yet he recovered, and remaineth well at this present, by the cure of *James Dalam* the Surgeon.

Lib. 3. anatom. cap. 9.

A crooked iron shot into the back, came forth at the Fundament.

Alexander Benedictus makes mention of a certain Country man, who, shot into the back with a dart, drawing out the shaft, the head was left behind, being 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 find it, he healed up the wound, but two moneths after this crooked head came forth at his fundament.

A swallowed needle voided by urin.

The same Author telleth that at *Venice* a Virgin swallowed a needle, which some two years after she voided by urin, covered over with a stony matter, gathered about viscous humours.

A needle running in at the buttock, came forth at the groin.

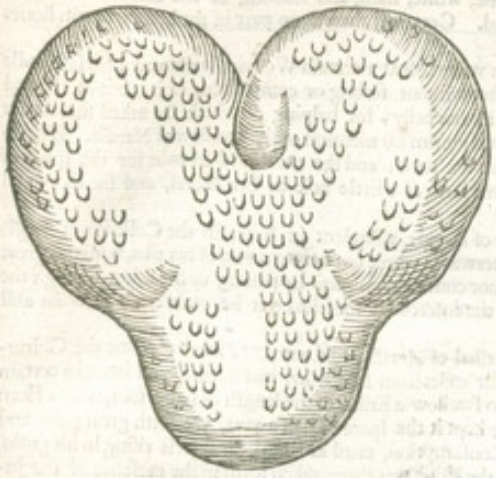
Catherine Perlan, the wife of *William Guerrier*, a Draper of *Paris*, dwelling in the *Jewry*, as she rode on Horse-back into the Country, a needle out of her Pin-cushion, got under her by accident, ran so deep into her right buttock, that it could not by any Art or force be plucked forth. Four moneths after she sent for me to come to her, and she told me that as often as she had to do with her husband, she suffered extreme pricking pain in her right groin; putting my hand thereto, as I felt it, my fingers met with something sharp and hard, wherefore I used the matter so, that I drew forth the needle all rusty: this may be accounted as a miracle, that Steel, naturally heavy, should rise upwards from the buttock to the groin, and pierce the muscles of the thigh, without causing an abscess.

A needle in the midst of a Stone taken forth of the bladder.

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 midst whereof was a needle, just like those that Shoe-makers use: the Patients name was *Peter Cocquin*, dwelling in the Street *Galand*, at the place called

called *Maubert* at *Paris*, and I think he is yet living. This Stone was shewed to King *Charles* the Ninth, for the monstrousness of the thing, I being then present, which being given me by the Surgeon, I preserve amongst my other rarities.

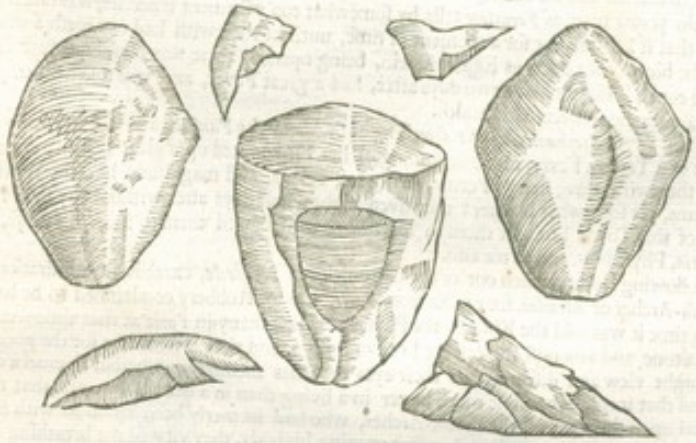
The Figure of a Stone taken forth of the Bladder of a Confectioner.



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, and was as thick as ones fist, yet was it happily taken out, the Patient recovering, *Francis Rousset* and *Joseph Javelle*, the Dutchess Physicians, being 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, staid in the midway of the Ureters. The figure of the extracted stone was this.

Anno Dom. 1569. *Laurence Collo* the younger, took three stones out of the Bladder of one dwelling at *Marly*, called commonly *Tere-vit*, because being troubled with the Stone from the tenth year of his age, he continually scratched his Yard, each of the Stones were as big as an Hens Egg; of colour white, they altogether weighed twelve ounces. When they were presented to King *Charles*, then lying at St. *Maure des Fausses*, he made one of them to be broken with a Hammer, and in the midst thereof there was found another of a Chesnut colour, but otherwise much like a Peach-stone. These three Stones, bestowed on me by the Brethren, I have here represented to the life.

The Effigies of the three fore-mentioned 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 he saw a man, which by an Abscess of his Loins, which turned to a Fistula, voided many Stones out of his Kidnies, and yet notwithstanding could endure to ride on Horse-back, or in a Coach. *John Magnus*, the Kings most learned and skilful Physician, having in cure a Woman, troubled with cruel torment and pains of the Belly and Fundament, sent for me, that by putting a *Speculum* into the Fundament, he might see if he could perceive any discernable cause of so great and pertinacious pain: and when as he could see nothing which might further him in the finding out of the cause of her pain (following Reason as a Guide) by giving her often Clysters and Purgations, he brought it so to pass, that she at length voided a Stone at her Fundament of the bigness of a Tennis-ball: which once avoided all her pain ceased.

A Stone by the force of Purging Medicins voided by the Fundament.

Hippocrates tells us that the Servant of *Dyseris* in *Larissa*, when she was young, in using Venery was much pained, and yet sometimes without pain, yet she never conceived. But when she was sixty years old, she was pained in the afternoon as if she had been in labour. When as she one day before noon had eaten many Leeks, afterward she was taken with a most violent pain far exceeding all her former, and she felt a certain rough thing, rising up in the orifice of her womb: but she falling into

5 *Epid.*

A Stone coming out of the neck of the Womb.

into a swound, another woman putting in her hand, got out a sharp stone of the bigness of a whirl, and then she forthwith became well, and remained so.

Lib.1. cap. de palp. cand.

In a certain Woman, who, as *Hollerius* tells, for the space of four Moneths was troubled with an incredible pain in making water, two stones were found in her heart, with many abscesses, her Kidnies and Bladder being whole.

Anno Dom. 1558. I opened in *John Bourlier* a Tailor, dwelling in the street of St. *Honore*, a watry abscess in his knee, wherein I found a stone, white, hard, and smooth, of the thickness of an Almond; which being taken out, he recovered. Certainly there is no part of the body wherein stones may not breed and grow.

No part of the body wherein stones may not be found.

Anthony Benevenius a Florentine Physician writes, that a certain Woman swallowed a brass Needle without any pain, and continued a year after without feeling or complaining of it: but at the end thereof she was molested with great pains in her belly; for helping of which she asked the advice of all the Physicians she could, making in the interim no mention of the swallowed Needle. Wherefore she had no benefit by all the Medicins she took; and she continued in pain for the space of two years, until at length the Needle came forth at a little hole by her Navel, and she recovered her health.

A Needle swallowed, came forth at the Navel some two years after.

A Scholar named *Chambelant*, a Native of *Bourges*, a Student in *Paris*, in the Colledge of *Presse*, swallowed a stalk of Grass, which came afterwards whole out between two of his ribs, with the great danger of the Scholars life. For it could not come there unless by passing or breaking through the lungs, the encompassing membrane, and the intercostal muscles; yet he recovered, *Fernelius* and *Haguet* having him in cure.

A sprig of Grass swallowed came forth whole again between the ribs.

Cabrolle Chirurgeon to Monsieur the Marshal of *Anville*, told me that *Francis Guillinet* the Chirurgeon of *Sommieres*, a small Village some eight miles from *Montpelier*, had in cure, and healed a certain Shepherd, who was forced by Thieves to swallow a Knife of the length of half a foot, with a Horn handle of the thickness of ones thumb: he kept it the space of half a year, yet with great pain, and he fell much away, but yet was not in a Consumption, until at length an abscess rising in his groin, with great store of very stinking quitture, the Knife was there taken forth in the presence of the Justices, and left with *Joubert* the Physician of *Montpelier*.

A Knife swallowed, came forth at an abscess in the groin.

Monsieur the Duke of *Roban* had a Fool called *Guido*, who swallowed the point of a Sword of the length of three fingers, and he voided it at his Fundament on the twelfth day following, yet with much ado: there are yet living Gentlemen of *Britany*, who were eye-witnesses thereof.

The point of a Sword swallowed, came forth at the fundament.

There have been sundry Women with child, who have so cast forth piece-meal children that have died in their Wombs, as that the bones have broke themselves 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* observes out of *Albucrasis*.

Wonderful excretions of Infants out of the Womb

It is not very strange that there have been Women, who troubled with a fit of the Mother, have lain three whole days without motion, without breathing, or pulse that were any way apparent, and so have been carried out for dead.

Women troubled with the Mother laid out for dead.

A certain young man, as *Fernelius* tells, by somewhat too vehement Exercise, was taken with such a Cough, that it left him not for a moment of time, until he therewith had cast forth a whole impostume of the bigness of a Pigeons Egg, wherein, being opened, there was found quitture exquisitely white and equal. He spit bloud two days after, had a great Fever, and was much distempered, yet notwithstanding he recovered his health.

An Impostume spit out, of the bigness of a Pigeons Egg.

Anno Dom. 1578. *Stephana Chartier* dwelling at St. *Maure des Fausses*, a Widow of forty years old, being sick of a Tertian Fever, in the beginning of her Fit vomited up a great quantity of choler, and together therewith three hairy Worms, in figure, colour, and magnitude like the Worms called Bear-worms, yet somewhat blacker; they lived eight whole days after without any food: the Chirurgeon of this Town brought them to Dr. *Milot*, who shewed them to *Feure*, *Le Gros*, *Marescot*, and *Courtin*, Physicians, and to me also.

Worms cast up in the Fit of an Ague.

This following History, taken out of the Chronicles of *Monstrele*, exceeds all admiration. A certain Frank-Archer of *Meudon*, four miles from *Paris*, was for Robbery condemned to be hanged: in the mean time it was told the King by the Physicians, that many in *Paris* at that time were troubled with the Stone, and amongst the rest the Lord of *Boscage*, and that it would be for the good of many, if they might view and discern with their eyes the parts themselves wherein so cruel a disease did breed, and that it might be done much better in a living than in a dead body; and that they might make trial upon the body of the Frank-Archer, who had formerly been troubled with these pains. The King granted their request; wherefore opening his body, they viewed the breathing parts, and satisfied themselves as much as they desired, and having diligently and exactly restored each part to its proper place, the body, by the Kings command was sewed up again, and dressed and cured with great care. It came so to pass, that this Frank-Archer recovered in a few days, and getting his pardon, got good store of money besides.

This narration exceeds not only all admiration, but also belief.

Alexander Benedictus tells, that he saw a Woman called *Victoria*, who having lost all her teeth, and being bald, yet had others come up in their places, when as she was fourscore years old.

Stephen Tessier a Chirurgeon of *Orleance*, told me that not long ago he cured one *Charles Verignol* a Serjeant of *Orleance*, of a wound received in his ham, whereby the two tendons bending the ham, were quite cut asunder. He took this order in the cure; he caused the Patient to bend his leg, then he sewed together the ends of the cut tendons, then placed the member in that site, and handled with that Art, that at length he healed the wound, the Patient not halting at all. Truly this is a memorable thing, and carefully and heedfully to be imitated by the young Chirurgeon.

Pratt. lib.64. cap.1.

How many have I seen, who wounded and thrust through the body 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 many on the contrary, have died of light and small wounds, not worth the speaking of?

A

A certain man was shot near to his groin with an Arrow, whom we have seen, saith *Hippocrates*, and he recovered beyond all mens expectation. The arrows head was not taken forth, for it was very deep in, neither did the wound bleed very much, neither did he halt: but we found the head and took it forth six years after he was hurt. Now *Hippocrates* gives no reason of its so long stay, but that he saith it might be suspected it lay hid between the Nerves, and that no Vein or Artery was cut thereby. *5. Epidem.*

CHAP. XX.

Of the wonderful original, or breeding of some Creatures.

WE have read in *Boistey*, that a certain Workman of *Avignion*, when as he lived in that City, opened a leaden Coffin, wherein a dead body lay, that was so closely soldered that the air could not get in; and as he opened it, he was bitten by a Serpent that lay therein, with so venomous and deadly a bite, that it had near to have cost him his life. Yet the original cause of this Creature is not so prodigious as he supposeth, for it is an usual thing for a Serpent to breed of any putrified carkass, but chiefly of mans. *Boist. in Histor. Prodig.* It is a common thing for a Serpent to breed of the dead corps of a man.

Baptista Leo writes, that in the time of Pope *Martin* the fifth, there was a live Serpent found enclosed in a vast but solid Marble, no chink appearing in such dense solidity, whereby this living Creature might breath. A live Serpent in a solid Marble.

Whilest in my Vineyard, that is at *Meudon*, I caused certain huge stones to be broken to pieces, a Toad was found in the midst of one of them. When as I much admired thereat, because there was no space wherein this Creature should be generated, increase, or live, the Stone-cutter wished me not to marvel thereat, for it was a common thing, and that he saw it almost every day. Certainly it may come to pass, that from the more moist portion of stones, contained in places moist and under ground, and the celestial heat mixing and diffusing it self over the whole mass of the World, the matter may be animated for the generation of these creatures. The cause of such wonderful generations.

CHAP. XXI.

Of the wondrous nature of some 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 be not wonderful of themselves, as those that consist of their own proper nature, and that working well and after an ordinary manner; yet they are wondrous to us, or rather monstrous, for that they are not very familiar to us. For the rarity and vastness of bodies, is in some sort monstrous. Of this sort there are many, 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 *Sirens*, *Nereides*, or Mermaids, who (according to *Pliny*) have the faces of women, and scaly bodies; yea, whereas they have the shape of man; neither yet can the fore-mentioned confusion and conjunction of seeds take any place here, for as we lately said, they consist of their own proper nature. *Lib. 9.*

When *Mena* was President of *Egypt*, and walked on the banks of *Nilus*, he saw a Sea-monster in the shape of a man coming forth of the Waters; his shape was just like to a man even to the middle, with his countenance composed to gravity, his hair yellow, yet intermixed with some grey, his stomach bony, his arms orderly made and jointed, his other parts ended in a Fish. Three days after in the morning, there was seen another Sea-monster, but with shape or contenance of a woman, as appeared by her face, her long hair, and swollen breasts: both these Monsters continued so long above water, that any one might view them very well.

The Effigies of the Triton *and* Siren *of* Nilus.

In our times (saith *Rondeletius*) in *Norway* was a monster taken in a tempestuous Sea, the which as many as saw it, presently termed a Monk, by reason of the shape which you may here see set forth.

The

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 scales: *Rondeletius* and *Gesner* have described it.

Gesner professeth that he received from *Jerome 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 scaly Sea-monster.

Not long before the death of Pope *Paul* the Third, in the midst of the Tyrrhene Sea, a Monster was taken, and presented to the Successor of this *Paul:* it was in shape and bigness like to a Lion, but all scaly; and the voice was like a mans voice. It was brought to *Rome* to the great admiration of all men, but it lived not long there being destitute of its own natural place and nourishment, as it is reported by *Philip Forest.*

Lib. 5. Chron.

An. Dom. 1523. the third day of *November*, there was seen at *Rome* this Sea-monster, of the bigness of a child of five years old, like to a man even to the Navel, except the Ears; in the other parts it resembled a Fish.

The

The Effigies of a Sea-monster with a mans Face.

Gesner makes mention of this Sea-Monster, and saith that he had the Figure thereof from a Painter, who took it from the very Fish, which he saw at *Antwerp*. The head looks very 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 ashore out of the water to catch a little child: for being hurt by stones cast by Fishermen 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 tells us that a Sea-Monster, with the head, mane, and breast of a Horse, and the rest of his body like a Fish, was seen and taken in the Ocean Sea, brought to *Rome*, and presented to the Pope.

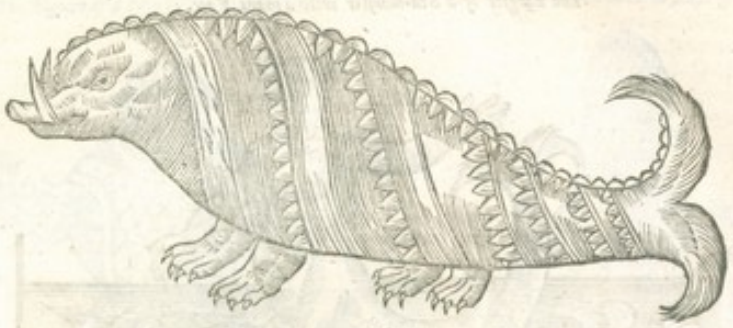
Olaus Magnus tells that a Sea-Monster taken at *Bergen*, with the head and shape of a Calf, was given him by a certain English Gentleman. The like of which was presented lately to King *Charles* the Nineth, and was long kept living in the Waters at *Fountain-bleau*, and it went oft-times ashore. This is much different from the common Sea-Calf or Seal.

*The Effigies of a monstrous * Sea-Calf.*

This great Monster was seen in the Ocean Sea, with the head of a Boar, but longer tusks, sharp and cutting, with scales set in a wonderful order, as you may see by the following Figure.

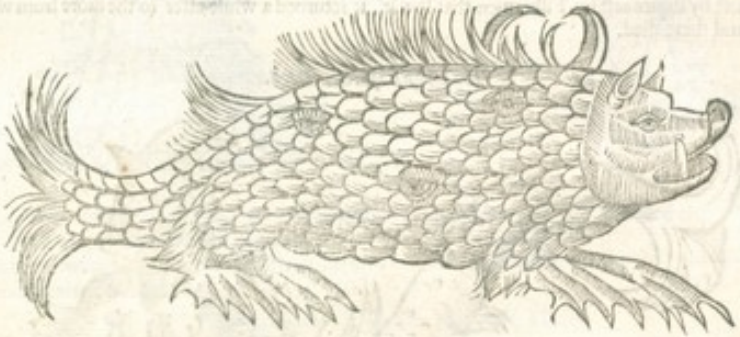
* This here figured is the Sea-Morse, taken commonly by our men in their *Greenland* Voyages: and I judge the Sea-boar and Elephant to be the same, but that the Painter hath shewed his skill too much in the one: and the other is an old Morse, as this here figured is a young one.

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 seventy two foot long, and fourteen high, and seven foot between the eyes: now the liver was so large that therewith they filled five Hogsheads; the head resembled a Swine, having as it were a half Moon on the back, and three eyes in the midst of his sides; his whole body was scaly.

The Effigies of a monstrous Sea-Swine.



The *Sea-Elephant*, as *Hector Boetius* writes in his description of *Scotland*, it is a Creature that lives both in the Water and ashore, having two teeth like to Elephants, with which as oft as he desires to sleep, he hangs himself upon a Rock, and then he sleeps so soundly, that Mariners seeing him at Sea, have time to come ashore and bind him, by casting strong ropes about him. But when as he is not awakened by this means, they throw stones at him, and make a great noise; with which awakened he endeavours to leap back into the Sea with his accustomed violence, but finding himself fast, he grows so gentle, that they may deal with him as they please. Wherefore they then kill him, take out his fat and divide or cut his skin into thongs, which because they are strong and do not rot, are much esteemed of.

The Effigies of a Sea-Elephant.

The Brabians of Mount *Mazoven*, which runs alongst the Red Sea, chiefly feed on a Fish called *Orobone*, which is very terrible and much feared by other Fish, being 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, coming sometimes to be fifteen foot long, and seeing it is a Creature that doth not bring forth young, but eggs, it useth at the most to lay some sixty eggs, no bigger than Goose eggs, rising to such bigness from so small beginnings (for the hatched young one is proportionable to the egg) she is very long lived.

It

It hath so small and useless a tongue, that it may seem to have none at all. Wherefore seeing it lives both on Land and Water; as it lives on Land it is to be taken for a tongue, but as it lives part of the life in the Water, it hath no use of a tongue, and therefore it is not to be reputed one. For Fishes either wholly want tongues, or else have them so impedite and bound, that they serve for little use. The Crocodile onely of all other things moves the upper jaw, the lower remaining unmovable: for her feet, they are neither good to take nor hold any thing; she hath eyes not unlike those of Swine, long teeth standing forth of the mouth, most sharp claws, a scaly skin, so hard that no weapon can pierce it. Of the Land Crocodile (resembling this both Land and Water one) is made the Medicin *Crocodilea*, most singular for sore-eyes, being anointed with the juice of Leeks, it is good against suffusions or dimness of the sight; it takes away freckles, pusiles, and spots; the Gall anointed on the eyes helps Cataracts, but the bloud clears the sight.

The Crocodile onely moves the upper jaw.

Expende diligenter Plinii locum, lib. 28. c. 8. Cosmograph. tom. 1. l. 2. 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 he saw some that were six paces long, and a yard cross the back, so that their very looks were formidable. They catch them thus: When as the Water of *Nilus* falls, the Egyptians let down a line, having thereto fastned an iron hook of some three pound weight, made very large and strong; upon this hook they put a piece of the flesh of a Camel or some other Beast; which when as he sees, he presently falls upon it, and devours it hook and all, wherewith when he finds himself to be cruelly pulled and pinched, it would delight you to see how he frets and leaps aloft; then they draw him thus hooked, by little and little to the shore, and fasten the rope surely to the next tree, lest he should fall upon them that are about him; then with Prongs and such things they so belabour his belly, whereas his skin is soft and thin, that at length they kill him, and uncasing him, they make ready his flesh and eat it for delicious food. *John Lereus* in his History of *Brasil*, writes that the Salvages of that Countrey willingly feed upon Crocodiles, and that he saw some who brought into their houses young ones, wherewith their Children gathering about it, would play without receiving any harm thereby.

How they take Crocodiles.

Cap. 10.

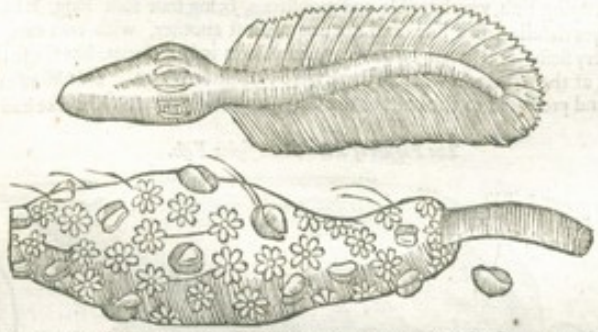
True (saith *Pliny*) is that common opinion, Whatsoever is brought forth in any part of Nature, that also is in the Sea, and many other things over and above, that are in no other place. You may perceive that there are not onely the resemblances of living Creatures, but also of other things; if you look upon the Sword, Saw, Cucumer, like in smell and colour 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 *Rondoletius*.

Lib 9. cap. 5.

The Sea-feather is like those feathers of Birds which are worn in hats for ornament, after they are trimmed and dress for that purpose. The Fishermen call them Sea-pricks, for that one end of them resembleth the end of a mans yard when the prepuce is drawn off it. As long as it is alive it swells and becomes sometimes bigger and sometimes lesser; but dead, it becomes very flaccid and lank: it shines bright on the night like a Star.

You may by this gather, that this which we here express, is the Grape whereof *Pliny* makes mention, because in the surface and upper part thereof it much resembles a fair bunch of Grapes; it is somewhat longish like a mishapen Club, and hangs upon a long stalk; the inner parts are nothing but confusion, sometimes distinguished with little glandules, like that we have here figured alone by it self.

The Figure of the Sea-feather and Grape.



In the Sea near the Island *Hispaniola* in the West-Indies, there may be seen many monstrous Fishes, amongst which *Thevet* in his Cosmography thought this most rare and observable, which in the vulgar Language of the Natives is termed *Aloes*. For it is just like a Goose, with a long and strait neck, with the head ending sharp, or in a Cone, not much unlike a Sugar-pear, it is no bigger than a Goose, it wanteth scales, it hath four fins under the belly for swimming; when it is above water you would say that it were a Goose.

The Sarmatian, or Eastern German Ocean contains Fishes unknown to hot Countries, and very monstrous. Such is that which resembling a Snail, equals a Barbel in magnitude of body, and a Stag in the largeness and branches of her horns: the ends of her horns are rounded as it were into little Balls, shining like unto Pearls, the neck is thick, the eyes shining like unto little candles, with a roundish nose set with hairs like to a Cats, the mouth wide, whereunder hangs a piece of flesh very ugly to behold. It goes on four legs, with so many broad and crooked feet, the which with a long tail, and variegated like a Tiger, serves her for Fins to swim withal. This Creature is so timerous, that though it be an *Amphibium*, that is, which lives both in the Water and shore, yet usually it keeps it self in the Sea, neither doth it come ashore to feed, unless in a very clear season. The flesh thereof is very good and grateful meat, and the bloud medicinable for such as

The bloud of great Tortoises good for the Leprosie. *Tom. lib.* 20.

have their livers ill affected, or their lungs ulcerated, as the bloud of great Tortoises is good for the Leprosie. *Thevet* in his Cosmography affirmeth that he saw this in *Denmark*.

In a deep Lake of Fresh water, upon which stands the great City 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 Conquerors of that place, *Hoga*. It is headed and eared almost like a Swine; from the chaps hang five long bearded *appendices*, of the length of some half a foot, like the beard of a Barbel. It hath flesh very grateful and good to eat. It bringeth forth live young like as the Whale. As it swims in Waters it seems green, yellow, red, and of many colours, like a Chameleon: it is most frequently conversant about the Shore-sides of the Lake, and there it feeds upon the leaves of the Tree called called *Hoga*, whence also the Fish hath its name. It is fearfully toothed, and a fierce Fish, killing and devouring such as it meeteth withal, though they be bigger than her self: which is the reason why the Fishermen chiefly desire to kill her, as *Thevet* affirmeth in his Cosmography.

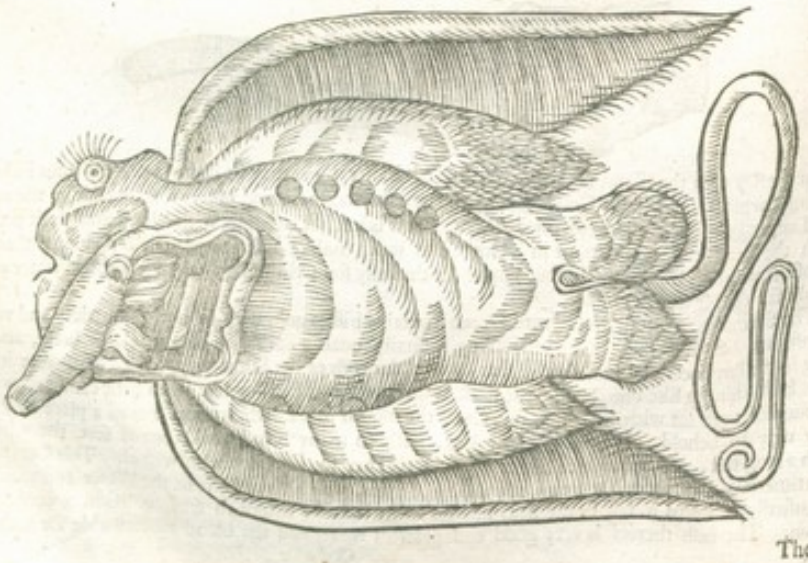
The monstrous Fish Hoga.

Andrew Thevet in his Cosmography writes, that as he sailed to *America*, he saw infinite store of flying Fishes, called by the Salvages *Bulampech*, who rising out of the Water, flie some fifty paces, escaping by that means from other greater fish that think to devour them.

This kind of flying Fish exceeds not the bigness of a Mackrel, is round-headed, with a blewish back, two wings which equal the length of almost all their body. They oft-times flie in such a multitude, that they fall foul upon the sails of Ships, whilest they hinder one anothers flight, and by this means they fall upon the Decks, and become a prey to the Sailers: which same thing we have read confirmed by *John Lerius* in his History of *Brasil*.

In the *Venetian* Gulf, between *Venice* and *Ravenna*, two miles above *Quioza*, *Anno Dom.* 1550. there was taken a flying Fish, very horrible and monstrous, being four foot long, it had a very great head, with two eyes standing in a line, and not one against another, with two ears, and a double mouth, a snout very fleshy and green, two wings, five holes in her throat, like those of a Lamprey, 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 City, as a thing whereof the like had not been formerly seen.

The Figure of a monstrous flying Fish.



There

There are so many and different sorts of shells to be found in the Sea, that it may be truly said, that Nature, the hand-maid of the Almighty, disports it self in the framing of them. In so great diversity I have chiefly made choice of three to treat of here, as those that are worthy of the greatest admiration. In these lie hid certain little Fishes, as Snails in their shells, which *Aristotle* calls *Cancelli*, and he affirmeth them to be the common companions of the *crusted and shell-fishes, as those which in their *species* or kind are like to Lobsters, and use to be bred without shells; but as they creep into shells, and there inhabit, they are like to shell-fishes. It is one of these that is termed the *Hermit*. He hath two somewhat long and slender horns, under which are his eyes, always standing out of his head, as those which he cannot pluck or draw in, as Crabs can. His fore-feet have claws upon them, wherewith he defends himself, and carries meat to his mouth, having two other on each side, and a third being a lesser, the which he useth in going. The female lays eggs, which hang forth at her back part as if they were put upon a thred, being joined together by certain little membranes. Lastly, in the opinion of *Ælian*, the *Cancellus*, or small Cray-fish is born naked and without a shell, but within a while after, she of many which she finds empty, makes choice of a fit one, and when as grown bigger, she cannot be contained or dwell any longer therein, or else being stimulated with a natural desire of copulation, she removes into a more capacious and convenient one. These little Cray-fishes oft-times fight together for their habitation, and the stronger carries away the empty shell, or else makes the weaker to quit possession. Now the shell is either of a *Nerita* or *Turbo*, and oft-times of a small purple; and entering into possession, she carries it about, there feeds and grows, and then seeks a more capacious one, as *Aristotle* saith in the formerly-cited place.

4. *De hist. anim. cap.* 4.

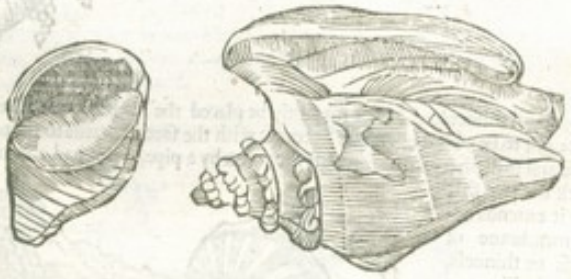
*By crusted is meant Crabs, Lobsters, Shrimps, and such like.

The description of the Hermit Cray-fish.

Lib. 7. *cap.* 31.

They change their habitation for two causes.

The Effigies of the empty Shells wherein to the Cancelli *use to creep to dwell.*



Some think that this *Bernard* the Hermit is that kind of *Cancellus* which is by *Pliny* termed *Pinnoter*; but in truth the *Pinnoter* is not a kind of *Cancellus*, or Cray-fish, but of a little Crab. Now in *Aristotle* there is much difference between *Cancellus* and *Cancer parvus*, though *Pliny* may seem to confound them; for he is bred naked, having his crust onely, but without a shell: wherefore seeing that by Nature he wants it, he diligently searches for it, and dwells in it, when as he hath found it: But the *Pinnoter* is not bred by it self alone, but in *Pinnæ* and some others, and he changeth not his habitation, because (as *Aristotle* thinks) being of the kind of Dwarf-Crabs, it never grows big, neither dwells it in empty shells. Now the *Pinna*, or *Pin*, is a kind of shell-fish, it breeds in muddy places, and is always open, neither is it at any time without a Companion, which they therefore call the *Pinnoter*, or *Pinnophylax*, (*i.e.*) the Pin-keeper, as *Pliny* saith. Verily that these things are thus, you may plainly perceive 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 be referred to the kind of Oisters, but the *Pinnoter* is a Dwarf-Crab: the *Pinna* opens her shell for the little fishes to enter thereinto; the *Pinnoter* stands by, observing if any come in; which if they do, he gives the *Pin* notice thereof by biting, who presently thereupon shuts her shell, and so they feed together upon that they catch by this means. Thus *Athenæus*. She is also for this her craft mentioned by *Plutarch* in his Writings. The *Pinnoter* is sometimes called by *Pliny*, *Cancer dapis affectator*.

What the *Pinnoter*, or Dwarf-Crab is.

What the *Pinna* is.

Lib. 9. *cap.* 42.

Lib. 3. *Deipn.*

The familiarity 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 he) opening her two large shells, enters into confederacy with the little Shrimp for getting of food; wherefore when little Fishes swim into her gaping shell, then the *Pinna*, admonished by the Shrimps biting her, shuts her shell; thus two unlike Creatures get their living together. But *Plutarch* seems to make the *Pinna* to be the Pearl-Oister in that Work of his, whereas he enquireth whether the craft of Water or Land-beasts be the greater.

Lib. 2. *de nat. deorum.*

The Figure of him out of his Cell.

The Effigies of Bernard *the Hermit housed in his Shell.*

Plin. lib. 9. c. 29.

But amongst the most miraculous Fishes may fitly be placed the *Nautilos*, or Sailer; of some called *Pompylos* (it is thought to be a kind of *Polypus*) it comes 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 floats; then putting back the two first tendrils or arms, it extends between them a membrane of wondrous fineness or thinness, which gathering air like as a Sail, and she rowing with the rest of her arms, guides her self with her tail in the midst, as a Rudder. Thus she sails along in imitation of Pinnaces, and if any thing affright her, she presently takes in Water, and sinks her self.

How the Whale may be reckoned amongst Monsters.

The better to store this Treatise of Monsters, abusing the name with the Poets, we 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 thirty 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, horny black Excrescences or Fins [which we vulgarly term Whale-bones] which by little and little end in small hairs like to a Swines bristles, which coming and standing out of his mouth, are in stead of Guides, lest whilest he swims with a blind and rapid violence, he might run against a Rock. His eyes are distant one from the other the space of four Ells, which outwardly appear small, but inwardly they are bigger than a mans head; wherefore they are deceived that say that they are no bigger than an Oxes eyes: his nose is short, but in the middle of his fore-head he hath a pipe whereat he draws in the air, and casts forth a whole shower or River of water, that therewithal he will even sink the Vessels or Boats of Mariners; when he hath filled himself beyond measure, he cries out or roars with so great or strong a voice, that he may be heard two miles off. He hath two very large fins upon his sides wherewith he swims, and under which in the time of danger he hides his young; he 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 he moves, he so tosseth the Sea, that he drowns and overturns the Boats that he toucheth. You may by dissecting them find that a Whale brings forth live young, and gives 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 *Aquitain*, at a small Town which is vulgarly called *Biarris*, some six miles distant from *Bayon*: whercunto I being sent by King *Charls* the Nineth when he was at *Bayon*, to cure the Prince of *Roche Sur-Yon*, I was an eye-witness how they are caught; and also I confirmed that which I had formerly read to that purpose, in that excellent and most true

A Whale brings forth young, and suckles them.

true History of Fishes set forth by *Rondoletius*. Now at that Town there is a little hill, in the top whereof there is a Tower of very great antiquity, from which as from a watch-Tower they keep watch whether or no any Whales swim that way. Wherefore the Watch-men from the Tower, either seeing, or by the horrible noise hearing a Whale to pass that way, 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 City if it were on fire, being furnished with weapons and all things fitting for that purpose. For the people of that country are very 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 being cast and fastned in her, they loose out huge long ropes, fastned to them, until such time as he be dead, then together with the ropes, and assisted by the waves of the Sea, they draw the Whale (wearied with running and labouring, and fainting by reason of the magnitude and multitude of his wounds, being in the time of their conflict diligently chased and driven toward the shore) on land, and merrily part the prey, each whereof hath his share, according to the number of the irons thrown, the magnitude of the wound, and the necessity and excellency of the wounded part for life: each of their harping-irons are known by their peculiar marks. In the heat of the skirmish many stand up and down in boats, onely for this purpose, to take up such as chance to fall into the Sea, lest they should be drowned. The Males are caught with more difficulty, the Females more easily, especially if their young ones be with them; for whilest 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 being very large, and of a very lax substance, it is powdered, and by most Gentlemen accounted for a dainty. The lard is dispersed over many Countries, to be boiled and eaten with fish in the time of Lent, that Cormandizers may have something to serve them in stead of flesh which is then forbidden. There is great store of Fat in them in the parts under the skin and belly, which melted, concretes not again, by reason of the subtilty; they keep it to burn in Lamps, and to use about their Ships. The houses of the Fish-eaters are built 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, being dried and polished, serve to make Busks for Women, Whip-staves, and little Staves, as also to stiffen garments. Many make seats or stools of the *Vertebræ*, or spondils of the back-bone.

How they are caught.

Why the Females are more easily caught then the Males.

Whale-bone.

The manner of cutting up the Whale.

In the River *Scalde*, ten miles from *Antwerp*, *Anno Dom.* 1477. the second day of *July*, there was a Whale taken, of a blackish blue colour, she had a spout-hole in the top of her head, out of which she cast great store of water: she was fifty eight foot long, and sixteen foot high, her tail was fourteen foot broad; from the eye to the end of her nose, was some sixteen foot. Her lower jaw was six foot on each side, she had twenty five teeth, which she could hide in her upper jaw, there being holes for them, it being wholly toothless; for which one thing this Whale may be judged monstrous, for that Nature hath denied them teeth, 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 them, so to chaw their meat. The longest of these teeth exceeded not six inches.

There is (as *Pliny* reports) a very small Fish accustomed to live upon Rocks, it is called *Echeneis*, never exceeding 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 being under sail with a good wind, may by the *Echeneis* seizing on her, as if she would devour her, be staid against the Sailers wills, and stand still as if she were in a safe harbor. Wherefore she is said in the *Actian* fight to have staid the ship of *Marcus Antonius*, hastening to go about and incourage his Souldiers, so that he was forced to enter into another ship, and thereupon *Cæsars* Navy came upon them too hastily, and before they were provided.

Lib. 9. cap. 25. & lib. 32. cap. 1. The wondrous power of the *Remora*.

She also staid the Ship of the Emperour *Caius* coming from *Astura* to *Antes*, his Ship of all the Navy making no way; neither did they longer wonder at this stay, the cause being presently known, some forthwith leaping into the Sea to find the cause thereof, there found her about the Ship, even sticking to the Rudder, and they shewed her to *Caius*, being wrath that this so small a thing should stop him, and countermand the endeavour of forty Rowers.

Therefore this little Fish tames and infringes the violence and madness of the world, and that with

with no labour, not without holding, or any other way, but onely by sticking thereto. Certainly, however it comes to pass, who from this example of holding of Ships, can doubt of any power or effect of Nature, in Medicins which grow naturally? Yea, and without this example, the *Torpedo* out of the Sea also may be sufficient; who afar off and at a distance, if it be 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 some Beasts.

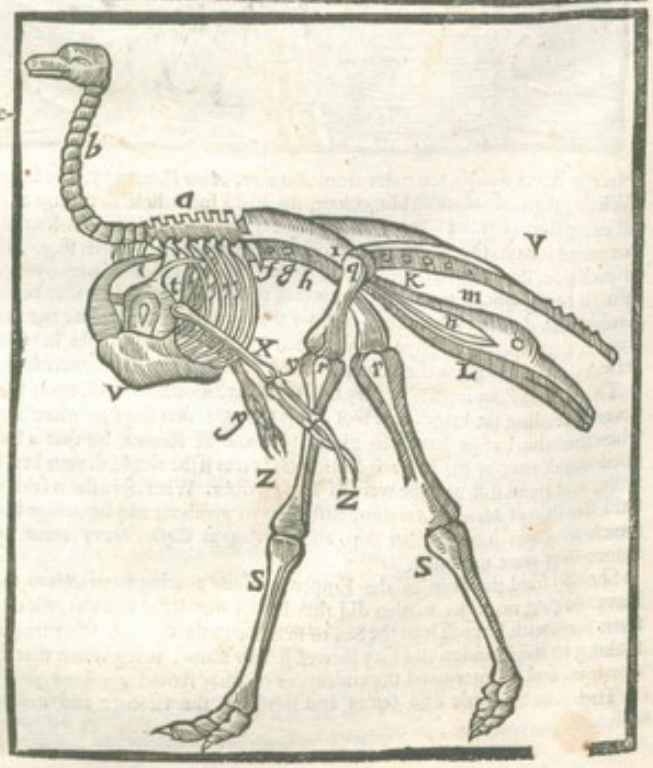
THat there be divers things not onely in the Sea, but also in the Air and Earth, which by the wonderful condition of their own Nature may equal that of Monsters, the onely *Estrich* may serve for a witness. It is the biggest of Birds, though indeed it partly resembles a Bird, and partly a Beast, (and it is familiar to *Africa* and *Æthiopia*) as which, contrary 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 outrun a horse. The natural force of the stomach in concocting, is miraculous; as to which nothing is untamable: she lays eggs of a wondrous largeness, so that they may be framed into cups: their feathers are most beautiful, as you may perceive by this following Figure.

The Estrich is between a Bird and a Beast.

The wondrous force of her stomach.

The Figure of an Estrich.

Any one may easily gather of what a prodigious magnitude an *Estrich* is, by the greatness of its bones. Three of these Birds were kept at the Kings charge, by the Marshal *De Rets*: one whereof dying, it was bestowed upon me, whereof I have with great diligence made a *Sceleton*.



The delineation of the Sceleton *of an Estrich.*

A *Shews the head, which was somewhat thicker than the head of a Crane, of the length of ones hand, plain from the crown even to the beak; the beak being divided to the middle region of the eye, being roundish at the end thereof.*

B *The neck a yard long, consisting of seventeen* Vertebræ, *each whereof on each side is furnished with a transverse process looking downwards, of some 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 foots length, consisting of seven* Vertebræ.

D *The holy-bone of two foot long, in whose top there is a transverse process, under which there lies a great hole.*

E *Three more, but less.*

F G H *After which there follows the cavity or socket, wherein to the head of the thigh bone is received and tied. This externally and on the side produceth a perforated bone, noted with the letter* I. *perforated I say at the beginning, for it is presently united at the letter* K. *then it is forked and divided into two other bones, whereof one is bigger than the other. The less is noted with the letter* L. *then they are both united at the letter* M. *each of them is half a foot and four inches long. But from that part whereon they first begun to be divided, to that whereas they are united, there is a hole some four fingers broad, but the length of ones 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: the end whereunder is the letter* O. *it is joined by coalition.*

P *The rump consisting of nine* Vertebræ, *like to a mans. 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 horses 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 grows smaller as it comes lower.*

S *Is the leg, to which the foot adheres, being one foot and a half long, divided at the end into two claws, the one bigger, the other less, whereof each one consists of three bones.*

T *Eight ribs, which are inserted into the* Sternon, *the three middlemost of those have a bony production like to a hook.*

V *Is the* Sternon, *consisting of one bone of some foots 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 many foot or more high from the feet to the beak: there are many other observable things in his composure, but I have thought fit to omit them for brevity sake.

Jerome Cardane in his Books *De Subtilitate*, writes that in the Island of the *Moluccas* you may sometimes find 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 lives aloft in the air, it is like a Swallow in body and beak, yet distinguished with diverse coloured feathers: for those on the top of the head are of a golden colour, those of the neck like to a Mallard, but the tail and wings like Peacocks; The description of the Bird of Paradise.

* it wants feet: wherefore if it become weary with flying, or desire sleep, it hangs up the body by twining the Feathers about some bough of a tree. It passeth through the air, wherein it must remain as long as it lives, with great celerity, and lives by the air and dew onely. The Cock hath a cavity depreſt in the back, wherein the Hen lays and sits upon her egs. I saw one at *Paris* which was presented to King *Charles* the Nineth.

* Whosoever desires to know more of the truth of this bird, let him read *Clusius* in the *Auctarium ad lib.* 5. *cap.* 1. *Exoticorum.*

We have read in *Thevets* Cosmography, that he saw a Bird in *America*, which in that Countrey Speech is called *Touca*, in this very monstrous and deformed, for that the beak in length and thickness, exceeds the bigness of the rest of the body; it feeds on pepper, as the Black-birds and Fellfars with us do upon Ivy-berries, which are not less hot than Pepper. *Tom. 2. l. 21. c. 22.*

A certain Gentleman of *Provence* brought a Bird of this kind from that Country, to present it to King *Charles* the Nineth, but dying in the way he could not present it alive. Wherefore the King wished the Mareschal *De Rets* to give her to me, that I might take forth her bowels and embalm her, that she might be kept amongst the Kings rarities. I did what I could, yet not long after she rotted: she resembled a Crow in body and feathers, but had a yellowish beak, clear, smooth,

and

and toothed like a Saw, and of such length and thickness as we formerly mentioned. I keep it yet as a monstrous thing.

Tom.1.cap.11. lib.4. *Thevet* writes, that in the Island *Zocotera* there is frequently found a certain wild Beast called *Hulphalis*, of the bigness of an Ethiopian Monkey. It is a very monstrous Creature, but in nothing more than that it is thought to live upon the air onely; the skin as if it were died in grain, is of a scarlet colour, yet it is in some places spotted and variegated: it hath a round head like to a bowl, with feet round, broad, and wanting hurtful nails. The Moors kill it and use to eat the flesh of it, being first bruised, that so it may be the more tender.

Thevet. tom.1. lib.11. cap.13. In the Realm of *Camota*, of *Aboh*, of *Benga*, and other Mountains of *Cangipa*, *Plimatig*, and *Catagan*, which are in the inner *India*, beyond the River of *Ganges*, some five degrees beyond the Tropick of *Cancer*, is found a Beast, which the Western Germans call *Giraff*. This Beast in head, ears, and cloven feet, is not much unlike our Doe; it hath a very slender neck, but is some six foot long, and there are few Beasts that exceeds him in the length of their legs: his tail is round, but reacheth no farther then his hams, his skin is exceeding beautiful, yet somewhat rough, having hair thereon somewhat longer than a Cow, it is spotted and variegated in some places with spots of a middle colour between white and chesnut, so as Leopards are: for which cause by some Greek Historians it is called *Camelopardalis*: it is so wild before it be taken, that with the good-will it will not so much as be seen. Therefore it inhabits and lives onely in desert and secret places, unknown to the rest of the Beasts of that Region; she presently flies away at the sight of a man, yet he is taken at length, for that he is not very speedy in running away; once taken he is as easily and speedily tamed as any wild Beast whatsoever. He hath above his crown two strait horns covered with hairs and of a foot length. When as he holds up his head and neck, he is as high as a Lance. He feeds upon Herbs, and Leaves, and Boughs, of Trees; yea, he is also delighted with bread.

The Effigies of a Giraffa.

Such as sail in the Red-sea along the Coast of *Arabia*, meet with an Island called by the Arabians *Cademota*: in that part thereof where the River *Plata* runs, is found a wild Beast called by the barbarous Inhabitants *Parassopi*, being of the bigness of a Mule, headed not unlike one, yet rough and haired like to a Bear, but not of so dark a colour, but inclining to yellow, with cloven feet like a Hart: she hath two long horns on her head, but not branched, somewhat resembling those so much magnified horns of Unicorns. For the Natives of the place, bitten by the venomous tooth of either Beast or Fish, are presently helped and recovered by drinking the water wherein such horns have been infused for six or seven days space, as *Thevet* in his Cosmography reports.

In

In one of the Islands of the *Molucaes* there is found a Beast living both on Land and Water like as a *Crocodile*; it is called *Campureh*, it is of the bigness of an Hart, it hath one horn in the fore-head moveable after the fashion of the nose of a Turky-cock: it is some three foot and a half long, and never thicker than a mans arm; his neck is covered over with an ash colour; he hath two feet like to a Gooses feet, wherewith he swims both in fresh and salt-waters. His fore-feet are like to a Stags, he lives upon fish. Many have perswaded themselves that this beast is a kind of Unicorn, and that therefore his horn should be good against poisons. The King of the Island loves to be called by the name of this Beast; and so also other Kings take to themselves the names of the wild Beasts, Fishes, or Fruits, that are most precious and observable in their dominions, as *Thevet* reports.

The Figure of an Elephant.

Mar-

The Indian Elephants are bigger than the African.

Mauritania and *Æthiopia* and that part of *Africk* that is beyond the Deſarts and Syrtes, bring forth Elephants; but thoſe of *India* are far larger. Now although in the largeneſs of their body they exceed all four-footed Beaſts, yet may they be more ſpeedily and eaſily tamed than other Beaſts. For they may be taught to do many things above the common nature of Beaſts. Their skin is ſomewhat like to a Buffles, with little hair upon it, but that which is, is aſh-coloured, his head large, his neck ſhort, his ears two handfuls broad, his noſe or trunk very long, and hanging down almoſt to the ground, hollow like as a Trumpet, the which he uſeth in ſtead of an hand, his mouth is not far from his breſt, not much unlike a Swines, from the upper part whereof two large teeth thruſt forth themſelves, his legs are thick and ſtrong, not conſiſting of one bone as many formerly have falſly believed (for they kneel to admit their Rider, or to be laden, and then riſe up again of themſelves) his feet are round like a Quoit ſome two or three hands bredth, and divided into five cleſts. He hath a tail like a Buffle, but not very rough, ſome three hands bredth long; wherefore they would be much troubled with Flies and Waſps, but that Nature hath recompenced the ſhortneſs of their tails by another way; for when they find themſelves moleſted, they contract their skin ſo ſtrongly, that they ſuffocate and kill theſe little Creatures taken in the wrinkles thereof; they overtake a man running by going onely, for his legs are proportionable to the reſt of his body.

How they keep Flies from them.

They feed upon the leaves and fruits of Trees, neither is any tree ſo ſtrong and well rooted, which they cannot throw down and break. They grow to be 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 any head-ſtall or reins; therefore you muſt ſuffer them to take the courſe and way they pleaſe. Yet do they obey their Countrey-men without any great trouble, for they ſeem after ſome ſort to underſtand their Speech, wherefore they are eaſily governed by their known voices and words. They throw down a man that angers them, firſt taking him up with their trunk and lifting him aloft, and then letting him fall, they tread him under foot, and leave him not before he be dead. *Ariſtotle* writes that Elephants generate not before they be twenty years old: they know not adultery, neither touch they any female but one, from which they alſo diligently abſtain when they know ſhe hath once conceived. It cannot be 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. Their females bring forth reſting upon their hind 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 Elephants teeth of a monſtrous and ſtupendious bigneſs, at *Venice*, *Rome*, *Naples*, and *Paris*; they term it Ivory, and it is uſed for Cabinets, Harps, Combs, and other ſuch like uſes.

Lib. 9. de Hiſt. anim. cap. 28.

It is not known how long an Elephant goes with young.

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

We have read in *Thevet*, that in *Florida* there are great Bulls, called in that Countrey Tongue *Beautrol*, they have horns of a foot long, a bunch on their backs like a Camel, their hair long and yellow, the tail of a Lion; there is ſcarce any Creature more fierce or wild, for it can never be tamed, unleſs it be taken from the dam. The Salvages uſe their hides againſt the cold, and their horns as an antidote againſt poiſon.

Their horns good againſt poiſon.

Tom. 1. lib. 2. cap. 10.

The ſame Author affirms, that whileſt he ſailed in the Red Sea, he ſaw a Monſter in the hands of a certain Indian Merchant, which in the bigneſs and ſhape of his limbs was not unlike a Tiger, yet had the face of a Man, but a very flat noſe: beſides his fore-feet were like a mans hands, but the hind like the feet of a Tigre; he had no tail, he was of a dun colour: 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 Tiger; they called it *Thanacth*.

The Figure of a Beaſt called Thanacth.

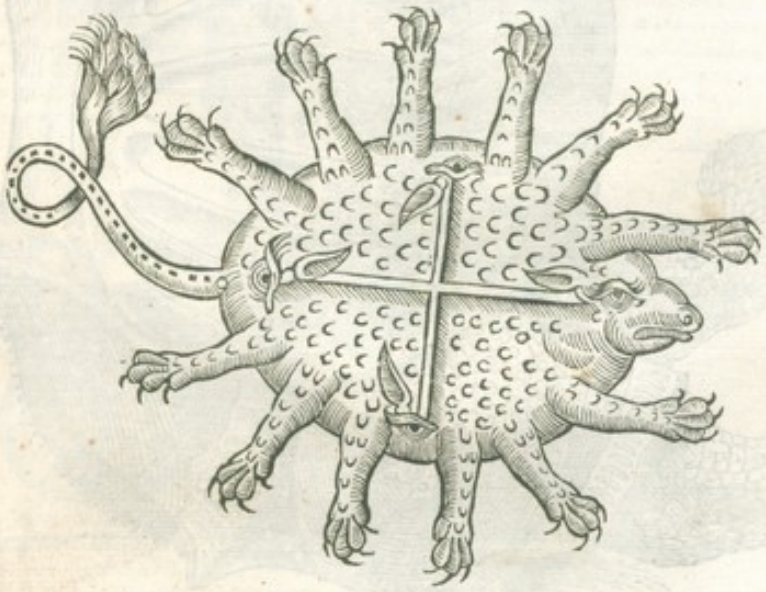
This following Monſter is ſo ſtrange that it will ſcarce be believed, but by thoſe that have ſeen it: it is bred in *America*, and by the Salvages called *Haiti*, of the bigneſs of a Monkey, with a great belly, almoſt touching the ground and the head and face of a child: being taken it mourns and

and sighs like to a man that is troubled and perplext; it is of an ash-colour, hath the feet divided into three claws, four fingers long, and sharper than those of a Lion: it climbs Trees and lives there more frequently than upon the ground, the tail is no longer than the bredth of three fingers. It is strange and almost monstrous that these kind of Creatures have never been seen to feed upon or eat any 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 Affrican History; it is very deformed, being round after the manner of a Tortoise two yellow lines crossing each other at right angles, divide his back; at every end of which he hath one eye, and also one ear, so that such a creature may see on every side with his four eyes, as also hear by his so many ears: yet hath he but one mouth, and one belly to contain his meat, but his round body is encompassed with many feet, by whose help he can go any way he please without turning of his body, his tail is something long and very hairy at the end. The inhabitants affirm, that his bloud is more effectual in healing of wounds than any balsam.

Blood as good as Balsom.

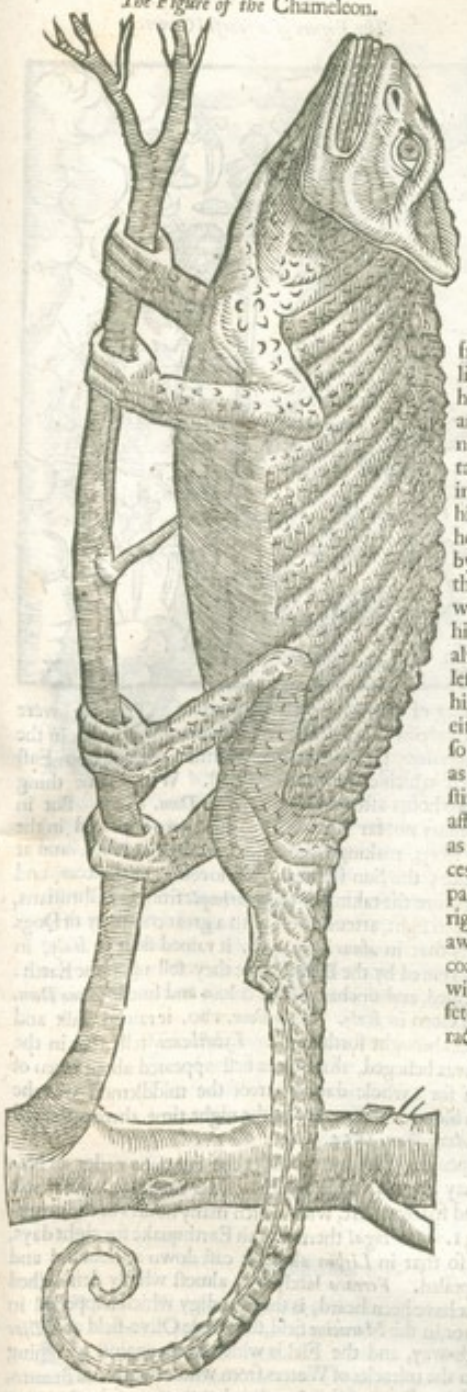


It is strange that the *Rhinoceros* should be a born Enemy to the Elephant; wherefore he whets his horn, which grows upon his nose, upon the Rocks, and so prepares himself for fight, wherein he chiefly assails the belly, as that which he knows to be the softest: he is as long as an Elephant, but his legs are much shorter, he is of the colour of Box, yet somewhat spotted. *Pompey* was the first that shewed one at *Rome*. *Plin. l. 8. c. 24.*

The Figure of the Rhinoceros.

The

The Figure of the Chameleon.



Africa produceth the *Cameleon*, yet is it more frequent in *India*: he is in shape and greatness like a Lizard, but that his legs are strait and higher, his sides are joined to the belly as in Fish, and his back stands up after the same manner, his nose stands out not much unlike a Swines, his tail is long, and endeth sharp, and he folds it up in a round, like a Serpent, his nails are crooked, his pace slow, like as the Tortois, his body rough, he never shuts his eyes, neither doth he look about by the moving of the apple, but by the turning of the whole eye. The nature of his colour is very wonderful, for he changeth it now and then in his eye and tail, and whole body beside; and he always assimilates that which he is next to, unless it be red or white. His skin is very thin, and his body clear; therefore the one of these two, either the colour of the neighbouring things in so great subtilty of his clear skin, easily shines as in a glass; or else various humours diversly stirred up in him, according to the variety of his affections, represent divers colours in his skin, as a Turky-cock doth in those fleshy excrescences under his throat, and under his head: he is pale when he is dead. *Mathiolus* writes that the right eye taken from a living Chameleon takes away the white spots which are about the thorny coat of the eye; his body being beaten, and mixed with Goats milk, and rubbed upon any part, fetcheth off hairs; his gall discusseth the Cataracts of the eye.

Plin. lib. 8. c. 33.

Arist. lib. 2. hist. anim. cap. 12.

The strange nature of the colour of the Chameleon.

CHAP. XIII.

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, exceeds all admiration. Yet have we often read it written by the Ancients, that the Face of Heaven hath been deformed, by bearded, tailed, and haired Comets; by Meteors representing burning Torches and Lamps, Pillars, Darts, Shields, Troops of Clouds hostilely assailing each other; Dragons, two Moons, Suns, and the like Monsters and Prodigies.

The Figure of a fearful Comet.

Antiquity hath not seen any thing more prodigious than that Comet which appeared with bloudy hair in *Uverstein*, upon the ninth day of *October*, 1528. for it was so horrible and fearful a spectacle, that divers died with fear, and many fell into grievous diseases going from the East to the South; it endured no longer than one hour and a quarter: in the top whereof was seen a bending arm holding a great Sword in a threatning hand; at the end thereof appeared three Stars, but that over which the point of the Sword directly hanged, was more bright and clear than the rest: on each side of this Comet were seen many Spears, Swords, and other kinds of Weapons died with bloud, which were intermixed with mens heads, having 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 fallen from Heaven, which have presently been turned into Swords and Rapiers. At *Sugolish* in the Borders of *Hungaria*, a Stone fell from Heaven with a great noise, the seventh day of *September*, *Anno Dom.* 1514. it weighed two hundred and fifty pound: the Citizens hanged it up with a great iron chain put through it, in the midst of the Church of their City, and used to shew it as a miracle to Travellers of better note, that pass that way. * *Pliny* reports that clashing of armour, and the sound of a Trumpet were heard from Heaven often, before and after the *Cimbrian* War. The same Author writes that in the third Consulship of *Marius* the *Amarines* and *Tudertines* saw the Heavenly Armies coming from East and West, and so joining, those being vanquished which came from the East. Which same thing was seen in *Lusatia*, at a Town called *Jubea*, two hours after midnight, *Anno Dom.* 1535. But in *Anno Dom.* 1550. upon the 19 day of *July*, in *Saxony* not far from *Wittenburg*, there appeared in the air a great Stag, incompassed with two armed Hosts, making a great noise in their conflict, and at the same instant it rained bloud in great abundance; the Sun seemed to be cloven in two pieces, and the one of them to fall upon the Earth. A little before the taking of *Constantinople* from the Christians, there appeared a great army in the Air appointed to fight, attended on with a great company of Dogs and other wild Beasts. *Julius Obsequius* reports that in *Anno Dom.* 458. it rained flesh in *Italy*, in great 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 unputrified, and unchanged in colour and smell. *Anno Dom.* 989. *Otho* the third being Emperour, it rained Corn in *Italy*. *Anno Dom.* 180. it rained Milk and Oil in great abundance, and Fruit-bearing Trees brought forth Corn. *Lycosthenes* tells that in the time of *Charles* the Fifth, whilest *Maidenburg* was besieged, three Suns first appeared about seven of the clock in the Morning, and then were seen for a whole day, whereof the middlemost was the brightest, the two others were reddish, and of a bloudy colour; but in the night time there appeared three Moons. The same appeared in *Bavaria*, *Anno Dom.* 1554.

* *Lib.* 2. *c.* 57.

Presages of the taking of *Constantinople.*

Monstrous Rains.

Earthquakes.

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. *Anno Dom.* 542. the whole Earth quaked, Mount *Ætna* cast forth flames and sparks of fire, with which many houses of the neighbouring Villages were burned. *Anno Dom.* 1531. in *Portugal* there was an Earthquake for eight days, and it quaked seven or eight times each day; so that in *Lisbon* alone it cast down a thousand and fifty houses, and more than six hundred were spoiled. *Ferrara* lately was almost wholly demolished by a fearful Earthquake. Above all which ever have been heard, is that Prodigy which happened in the time of *Pliny* at the death of *Nero* the Emperor, in the *Marucine* field, the whole Olive-field of *Vellius Marcellus*, a *Roman* Knight, going over the High-way, and the Fields which were against it coming 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. *Augustin*, that the fire of the Sacrifice which for those seventy years of the Babylonian captivity endured under the Water, was extinguished, *Antiochus* selling the Priesthood unto *Jason*. What miracle is this, that the Fire should live in the Water, above its force and natural efficacy, and that the Water should forget the extinguishing faculty! Verily Philosophers truly affirm that the Elements which are understood to be contrary, and to fight in variety among themselves, are mutually joined and tied together by a marvellous confederacy.

Lib. 2. *cap.* 73.

The End of the Five and Twentieth Book.

BOOK

BOOK XXVI.

Of the FACULTIES *of* SIMPLE MEDICINS, *As also of their* Compoſition *and* Uſe.

THE PREFACE.

AMongſt the cauſes which we term healthful, and other remedies which pertain to the health of Man, and the expelling of Diſeaſes, Medicins eaſily challenge the prime place; which (as it is delivered by Solomon) *God hath produced out of the Earth, and they are not to be abhorred by a Wiſe man; for there is nothing in the World, which 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 knowledge of Medicins, have amongſt the Ancients acquired an opinion of Divinity. It cannot by words be expreſſed what power they have in healing. Wherefore the knowledge of them is very neceſſary not onely for the preventirn, but alſo for the driving away of Diſeaſes.*

The excellency of Medicins.

CHAP. I.

What a Medicin is, and how it differeth from nouriſhment.

WE define a Medicin to be that which hath power to change the body according to one or more qualities; and that, ſuch as cannot be changed into our Nature: contrary whereto we term that nouriſhment which may be converted into the ſubſtance of our Bodies. But we define them by the word *Power*, becauſe 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 medicin to one, is meat to another; and that which is meat to this, is medicin to that. Thus for example, Hellebore is nouriſhment to the Quail, but a medicin to man: Hemlock is nouriſhment to a Starling, but poiſon to a Gooſe: the Ferula is food to an Aſs, but poiſon to other Cattel. Now this diverſity is to be attributed to the different natures of Creatures. It is recorded in Hiſtory, 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 very breath ſhe breathed was deadly to the by-ſtanders. Therefore it ought to ſeem no marvel, if at any time it happen, that Medicins turn into the nature and nouriſhment of our bodies: for we commonly may ſee Birds and Swine feed upon Serpents and Toads without any harm: and laſtly,

——— Serpente Ciconia pullos
Nutrit, & inducit per devia rura lacerta:
Illi eadem ſumptis quærunt animalia pennis.
The Stork with Serpents and with Lizards caught,
In wayleſs 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 difference of Medicins in their matter and ſubſtance.

EVen as the concealed glory of worldly riches lieth hid in the bowels of the Earth, and depth of the Sea and Water, as Gold, Silver, and all ſorts of Metals, Gems, and pretious Stones, furniſhed with admirable Virtues; ſo we may behold the ſuperficies of this Earth cloathed with almoſt an infinite variety of Trees, Shrubs, and Herbs: where we may contemplate and wonder at the innumerable diverſities of Roots, Leaves, Flowers, Fruits, Gums, their Smells, pleaſant Taſtes and Colours, but much more at their Virtues. This ſame Mother Earth, as with her Breſts, nouriſheth marvellous diſtinct kinds of living Creatures, various in their ſpringing, increaſe and ſtrength, wherein the immenſe 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 Patrimony, ſo ample and plentiful proviſion of Nature for our delight in nouriſhment and neceſſity of healing. Therefore the ancient Phyſicians have rightly delivered, that all ſorts of Medicins may be abundantly had from living Creatures, Plants, the Earth, Water, and Air.

The Earth the Mother of Riches and Medicins.

Medicins are taken from living Creatures either whole and entire, or elſe the parts and excrements of them. We oft-times uſe in Phyſick whole Creatures, as Foxes, Whelps, Hedge-hogs, Frogs, Snails, Worms, Crabs, and other living Creatures. We alſo make uſe of ſome parts of them, as the Liver of a Wolf or Goat, the Lungs of the Fox, the Bone of the Stags heart, *Cranium humanum*, Eat, Bloud, Fleſh, Marrow, the Cods of the *Caſtor*, or Beaver, which is therefore termed *Caſtoreum*, and ſuch

What Medicins taken from living Creatures.

other particles that are useful in Physick. We know that also there are some Medicins taken from Excrements, as Horns, Nails, Hairs, Feathers, Skin; as also from Urin, Dung, Spittle, Honey, Eggs, Wax, Milk, Wool, Sweat, and others of this kind, under which we may comprehend Musk, Civet, Pearl, *Oesipus*, and sundry others of this nature.

What from Plants. We take Medicins from Plants, both whole, and also from their parts, whether Trees, Shrubs, or Herbs. For we oft-times use Succory, Marsh-mallows, Mallows, Plantain, and the like, whole: but otherwhiles onely the roots of Plants, their Pith, Wood, Bark, Shoots, Stalks, Leafs, Flowers, Seeds, Fruits, Juices, Gums, Rosins, Mosses, and the like.

What from the Earth. Things taken from the Earth, for the use and matter of Medicin, are either Earths, Stones, or Minerals. The sorts of Earth are Bole-Armenick, *Terra sigillata*, Fullers-earth, Chalk, Potters-clay, and such like. Stones, are the Pumice, Marchasite 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, Antimony, Cerusse, Brimstone, Cinnabar, Litharge of Gold and Silver, Tutty, true Pompholyx, Verdigreece, Alum, Roman Vitriol, Copras white and green, Salts of sundry kinds, both of Arsenicks, and such like.

What from the Water. The following Medicins are from Fresh water, Rain water, Spring water, River water, and all things thence arising, as Water-Lentils, common Flags, Water-Lillies, Water-Mints, and all the Creatures that live therein. From the Salt water are taken Salt, *Alcyonium*, all sorts of Coral, Shells of Fish, the Herb *Androsace* (which grows in plenty in the Marshes at *Fontignan* and *Cape de Sete*) *Asphaltum*, which is found in the Dead Sea.

What from the Air. From the Air proceeds *Manna*, therefore called *Mel Aereum* (*i.e.*) Honey of the Air, and also all other kinds of dew that are useful in Physick, by reason of the Virtues they receive from the Sun which raiseth them up; from the Air, whereas they make some stay; 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 endued with one or more of the Four Faculties, whereof I now purpose to treat.

The first Faculty common to all the rest, and as it were their foundation, flows 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 Medicin, as may appear by this following.

The *Simple* quality is either to Heat, Cool, Humect, or Dry.

The *Compound* arising from two joined qualities, either Heats and Dries, Heats and Moistens, Cools and Dries, Cools and Moistens.

Heat moderate, Heats, Attenuates, Rarifies, opens the Passages, Digests, Suppurates. Immoderate, Inflames and burns, Bites, whence follows Violent attraction, Rubrification, Consumption, Colliquation, an Eschar, Mortification.

Cold moderate, Cooleth, Condenseth, Obstructeth. Immoderate, Congeals, Stupefies, Mortifies.

Moisture moderate, Humects, Lubricates, Levigates and mitigates, Glues. Immoderate, Obstructs, lifts up into a flatulent tumour, especially if it be a vaporous humidity.

Drineſs moderate, Dries, Rarifies, Attenuates. Immoderate, Binds, Contracts or shrinks, causeth Chops and Scales.

1. *Simp.* & 2. *de aliment.* The effect of these qualities is distinguished, and as *Galen* observes, digested into these orders, which we term Degrees, so that by a certain proportion and measure they may serve to oppugn Diseases, as the same *Galen* affirms. For to a Disease (for example) hot in the second degree, no other Medicin must be used than that which is cold in the like degree: wherefore all simple Medicins are, Hot, Cold, Moist, or Dry; in the beginning, middle, or extreme, of the first, second, third, or fourth degree.

The Heat, Coldness, Moisture, Drineſs, of the first, second, third, fourth degree, is either obscure, manifest, vehement, or excessive.

Examples of the degrees of heat. An example of heat distinguished thus by degrees, may be thus; warm water is temperate; that which is a little hotter, is the first degree of heat; if manifestly hot, it is in the second degree; but if it heat more vehemently, it may be thought to come to the third; but if it scald, then we know that it hath arrived to the fourth degree of heat. Such also is the distinction of coldness, moisture, and drineſs by degrees. Wherefore it will be worth our labour to give you examples of certain Medicins, distinguished in their order and degree, by which you may the more easily give conjecture of the rest.

Simple Medicins hot in the

First degree. *Absynthium, Althæa, Amygdala dulcia, Beta, Brassica, Chamæmelum, Ladanum, Semen Lini, Saccarum, Ervum, sive Orobus, Vinum novum*: for old is judged hot in the second or third degree, as it is more or less years old.

Second degree. *Ammoniacum, Artemisia, Anethum, Fœnugræcum, Mastiche, Salvia, Marrubium, Melissa, Apium, Chamæpitys, Crocus, Ficus, Thus, Myrrha, Mel, Nux moschata, Pix utraque, tum arida corporibus particulisque solidioribus aptior, tum liquida delicatioribus, Scylla, 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 Sativa.*

Fourth degree. *Alium, Cepa, Euphorbium, Nasturtium, Pyrethrum, Sinapi, Tithymalli, Anacardi, Chelido-*

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 wild and not cultivated things, becomes more ſtrong and acrid than 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, Polygonum, 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. Certe nitroſum & ſalſum guſtu percipitur, quo fit ut calidæ & ſiccæ ſit naturæ, Opium.*

Simples moiſt in the

First degree. *Bugloſſum, Viola, Malva, Rapum, Spinacia.*

Second degree. *Ammoniacum, Lactuca, Cucurbita, Cucumis, Meloues, Portulaca.*

Simples dry in the

First degree. *Thus, Chamæmelon. 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, Abſynthium, Myrtus, Acetum, Aloe, Malium, Cuminum, Sanguis draconis, Galla, Sabina.*

Fourth degree. *Piper, Allium, Naſturtium, Sinapi, Euphorbium.*

Thoſe we have mentioned have of themſelves 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 cauſes. This ſhall be made manifeſt by the following examples. The effects of the firſt qualities by accident.

External heat by accident refrigerates the body within, becauſe it opens the paſſages and pores, and calls forth the internal heat, together with the ſpirits and humours by ſweats: whence it follows that the digeſtion is worſe, and the appetite is diminiſhed. The ſame encompaſſing heat alſo humects by accident, whileſt it diffuſes the humours concrete with cold: for thus Venery is thought to humect.

The like may be ſaid of Cold, for that it heats, not by its 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 body, hinders the breathing forth and diſſipation of the native heat. Whence it is inwardly doubled, and the concoction better performed, and the appetite ſtrengthened. This ſame Cold alſo dries by accident, when as it by accident repercuſſes the humour that was ready to flow down into any part, and whileſt it concretes that which is gathered in the part: for thus, by the immoderate uſe of repercuſſers, an œdematous tumor proceeding from groſs and viſcid phlegm, degenerates into a *ſcirrhus*.

Drineſs and Moiſture, becauſe 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 be judged as matter, or a ſubject.

CHAP. IV.

Of the Second Faculties of Medicins.

WE term thoſe the Second Faculties of Medicins, which have dependance upon the firſt, which are formerly mentioned, as it is the part of *Heat* to Rarifie, Attract, Open, Attenuate, Levigate, Cleanſe. Of *Cold*, to Condenſe, Repercuſs, Shut up, Incraſſate, Exaſperate, Conſtipate. Of *Moiſture*, to Soften, Relax. Of *Drineſs*, to Harden, Stiffen.

Hence we term that an attractive Medicin, which hath an attractive faculty, as on the contrary, that a Repercuſſive that repels; a detergent, that which cleanſes viſcous matter. We call that an Emplaſtick Medicin, which not onely ſhuts up the pores of the body, but reduces the liquid bodies therein contained to a certain equality and ſubſtance. Thus alſo Emollients, Relaxers, and the reſt, have their denominations from their effects, as we ſhall declare hereafter.

CHAP. V.

Of the Third Faculties of Medicins.

THe third Faculty of Medicins depends for the moſt part upon the firſt and ſecond Faculties ſometimes conjoined, otherwhiles ſeparate. Alſo ſometimes it follows neither of theſe Faculties, but a certain property and inexplicable quality, which is onely known by experience. Now the operations of this third Faculty are to agglutinate, to fill with fleſh, to cicatrize, to aſſwage pain, to move or ſtay the Urin, Milk, Seed, the Courſes, Sweats, Vomits, and perform ſuch like operations, in or about the body.

Thus the generation of fleſh is produced by the concourſe of two Faculties, that is, of drying and cleanſing. But drineſs and aſtriction produce a glutinating and cicatrizing faculty. A hot and attenuating faculty cauſeth Sweats, moves Urin, the Courſes, and the like in the body; but contrary Faculties retard and ſtop the ſame.

To mitigate pain, proceeds onely from the Faculty, to wit, from heat, or a moderately heating faculty;

faculty to procure rest, from cold onely, or coldness joined with some moisture. But to procure vomit, proceeds neither from the first nor second faculty, but from a certain occult and essential property, which is naturally implanted in Agarick, and other nauseous and vomitory Medicins.

CHAP. VI.

Of the Fourth Faculty of Medicins.

The fourth faculty of Medicins depends onely upon an occult property.

THe Fourth Faculty of Medicins is not of the same condition with those that are formerly mentioned; for it depends not upon them, or any other manifest or elementary quality, but on an occult property of the whole substance; by means whereof it works rather upon this than that part, upon this rather than that humour. Wherefore Physicians cannot by any reason find out this faculty, but onely by experience, as we have said a little before of Medicins procuring Vomit. Hence it is that names are given to those Medicins from those parts that they chiefly respect: For they are termed Cephalicks which respect the Head; as Betony, Marjoram, Sage, Rosemary, *Staechas*. Pneumonicks, which respect the Lungs; as Liquorice, sweet Almonds, Orris, Elecampane. Cordials, that strengthen the heart; as Saffron, Cinamon, Citrons, but chiefly their Rinds, Bugloss, Coral, Ivory. Stomachical, which respect the Stomach, and the orifice thereof; as Nutmeg, Mint, Anise, Mastick, Pepper, Ginger. Hepaticks, which respect the Liver; as Wormwood, Agrimony, Spikenard, Succory, Sanders. Spleneticks, which have relation to the Spleen; as Tyme, *Epithymum*, Broom-flowers, Ceterach, Capers, the Bark of their Roots, the Bark of Tamarisk. Diureticks, such as respect the Kidneys and Urinary passages; as the Roots of Smallage, Asparagus, Fennel, Butchers-broom, the four greater Cold Seeds, Turpentine, Plantain, Saxifrage. Arthriticks, or such as strengthen the joints; as Cow-slips, *Chamæpitys*, Elecampane, Calamint, Hermodactyls, and the like.

To this Rank may be referred purging Medicins, which, furnished with a specifick property, shew their efficacy on one Humour more than on another Humour, and that impact more in one part than in another. For thus Agarick chiefly draws phlegm from the Head and Joints, Rhubarb, draws choler chiefly from the Liver, and hurts the Kidneys. But let us here forbear the consideration of things, as not pertaining to Surgery. But some Medicins of this kind are furnished with one simple faculty, othersome with more, and those contrary, whereof your taste may give you sufficient notice: for Rhubarb at the first touch of the tongue is found acrid and hot; but when you come to chaw and throughly to taste it, you shall find it to partake of an earthly astriction. Therefore because tastes give notice of the faculties of Medicins, therefore I have thought good to treat of them briefly.

CHAP. VII.

Of Tastes.

Lib. 1. *simpl.*

TAste, as *Galen* delivers according to *Aristotle* and *Theophrastus*, is a certain concoction of moisture in driness, caused by means of heat, which we know or discern by the tongue well tempered, and fittingly furnished with spittle and his nerves. 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 oily or fat, and the insipid. Now they are thought so many according to the different degrees of concoction; for it appears 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 observes this order in the concoction of sapid bodies, that are the first the acerb taste should take place, then the austere, and lastly the acid: from these (as it were) rudiments of concoction, arises an insipid, then an oily, then a sweet perfectly concocted and temperate. This concoction exceeding the bounds of mediocrity, there arises a salt taste, then a bitter, and then an acrid with the highest excess of almost a fiery heat. Yet I would be thus understood, that all things that are by Nature sapid, do not always ascend to the height of sweetness by the degrees of acerbity, austerity, and acidity, as though it were of absolute necessity, that all things that are sweet, should be acerb, austere, and acid. For there are many things found, especially in Plants and their Fruits, which when they shall arrive to their perfection and maturity, are acid, bitter, or salt: but being yet unripe, and not come 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 Worm-wood and Aloes, acrimony in Pepper or Pellitory, is a perfection of Nature, as full ripeness and perfect concoction, and not an excess of heat in that *Species*. Also acerbity and austerity is a perfection of Nature, and not a rudiment in Services and Cornelians; acidity or tartness is also in verjuice. But in very many things it so falls out, that the sweet or fatty tastes become so, and acquire their perfection by concoction, as in Grapes, Figs, Pears, Apples, and almost all other such Fruits, as we 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, being less humid then the austere, but much less than the acid. It notably cools and dries, it condensates, binds, repels, especially from the superficies, and it also exasperates; this taste resides, and may be found in Pomegranate Pills, Galls, Sumach, and Cypress-nuts.

The austere.

The austere is nighest in temper and effects to the acerb, but somewhat moister; for the acerb absolutely consists in a terrestrial and cold substance. Wherefore this, increased by a degree of concoction, acquires more store either of heat alone, or else of moisture alone, or else of both together: moisture,

moiſture, I ſay, and that is either Airy or elſe Watery. Therefore if theſe fruits, which before their maturity are acerb, have an acceſſion of heat, then do they become ſweet, as you perceive by Cheſnuts; but if there be an acceſſion of moiſture onely, and that more groſs, of acerb they become auſtere: for both the taſtes are in the like degree of cold, but the auſtere is the moiſter. But if to the ſame frigidity remaining in Fruits, a certain humidity accrew, then is there cauſed an acid taſte. But if they have an acceſſion of a wateriſh moiſture and heat, they will acquire a ſweet taſte, or elſe oily, if the humidity accrewing with the heat be airy.

I have judged it requiſite to admoniſh you hereof, that you might know by what means ſapid bodies mitigated become ſweet of acerb, as it were by theſe interpoſed degrees of auſterity, acidity, and oilineſs, as they acquire a various acceſſion of heat and moiſture ſeparately, or conjunctly.

Now by all that we have delivered, you may gather, that all acerb and auſtere things are cold and dry; and as they are cold, they repel and hinder defluxions: as they are dry 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 dry, not partaking of moiſture or water. Now auſtere things conſiſt (as it were) in a middle matter, that is, in a more dilute terrene body, as it is apparent in Services, unripe Grapes, Cornelians, Medlars, Crabs, wild Pears, and all ſorts of unripe Fruits, whence it is termed a crude taſte.

The acid taſte is of a cold and wateriſh nature, but moſt ſubtle, by benefit whereof it penetrates and divides almoſt as powerfully as the acrid. It incides or divides, attenuates, bites, cleanſes, opens obſtructions, repels and dries. For by the means of the deep piercing cold, it repels all defluxions; and by the drying faculty, which is ſtrong even in its watery conſiſtence, it ſtays and ſtops all bleedings, the Hæmorrhoids and Dyſenteries. The force thereof is chiefly manifeſt in Vinegar, as alſo in the juice of Citrons, Sorrel, Cherries, Berberries, and the like. And this is the nature of cold taſtes, now it is time we ſpeak of ſuch as are temperate. The acid taſte.

The inſipid is unproperly termed a taſte, as that which is rather a privation of taſte, it is in ſome ſort cold, and of a very wateriſh and groſs nature, it inſpiſſates, conſtipates, and ſtupifies. This kind of taſte is chiefly manifeſt in Water, next in Gourds, Citruls, and many ſuch like things. The inſipid.

The oily taſte is hot, humid, airy; therefore it humects, relaxes, mollifies, lubricates. Of this kind are Oil, Butter, Fat which is not rancid by age, nor acrid by nature, as that of Lions and Foxes. The oily.

The ſweet taſte is made by a moderate and well concocting heat, conſiſting in a matter more tenuious and hot than the inſipid, but in ſomewhat more groſs than the oily, from which in the firſt qualities it doth not differ; therefore it is of a hot, airy, and temperate nature. Therefore every ſweet thing detergeth, levigates, concocts, ripens, relaxes, and aſſwageth pain. Examples of this taſte may be had in Sugar, Hony, Manna, ſweet Almonds, Milk, and other like. Now let us come to hot taſtes. The ſweet.

The ſalt taſte is hot and aſtringent, leſs earthy than the bitter, as that which reſides as it were in a middle matter. For it proceeds from an earthy drineſs, which is formerly torrified and attenuated by the force of heat in a watery humidity. Wherefore that which is ſalt contracts the pores, cuts, cleanſes, digeſts, or rather dries up the humours by the drineſs thereof, without any manifeſt ſenſe of heat, whence it is that it vindicates from putrefaction. Under this kind are contained 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, earthy, and drying; for the matter thereof is groſs and earthy, which the abounding heat hath torrified and dried up. Wherefore bitter things taken inwardly, purge and carry away ſuperfluous humours: and outwardly applied, they mundifie and deterge ulcers, they open the mouths and paſſages of the Veins oft-times by their abſtergent faculty, whence it is that they move the Courſes and Hæmorrhoids. The principal things endued with this taſte are Aloes, Gall, Wormwood, Gentian, the leſſer Centaury, Coloquintida, Fumitory, Soot, and ſuch like. The bitter.

The acrid taſte is hot, of a ſubtile and fiery nature; for it is kindled of a hot, ſubtle, and dry matter, neither can it conſiſt in any other. Therefore that which is acrid, heats, pricks, or bites the mouth by acrimony, it heats, and oft-times burns, it penetrates, opens the paſſages, attenuates, attracts and draws forth groſs humours, evacuates and ſends 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, *Chamælen*, the juice of *Thapſia*. The Veſicatories are Dittander, Cantharides, Crow-foot, Muſtard, Pellitory of *Spain*, Euphorbium. But the cauſtick and eſcharotick are Lime, Oak-aſhes, and the like. The acrid.

But we know Medicins 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 we judge of, and try the goodneſs of Medicins, and diſtinguiſh the true legitimate from the adulterate. The Touch judges what are hot and cold, moiſt and dry, rough and gentle, or ſmooth, hard and ſoft, brittle or friable, glutinous and viſcid, drie or ſlippery. We approve of the goodneſs of Medicins by their colour, brightneſs or duskineſs, whereof the eye is judge; for we commend that Senna which is ſomewhat greeniſh, but diſlike the whitiſh: as alſo we like well of ſuch Caſſia as is black both within and without, ſhining and full, and not dry and ſhrunk up. Yet the judgment of the firſt qualities by the colour is deceitful, or none at all; for ſuch things as are white, or the colour of Snow, are not therefore cold: for ſundry of them are hot, as Lime. Neither are red things to be therefore judged hot, for Roſes are cool. Alſo Medicins are choſen by the ſmell; for ſuch as have a good, freſh, and a natural ſmell, are commonly hot, and in their perfect vigor. On the contrary, things that want ſmell, are for the moſt part cold and evanid. By Hearing we diſtinguiſh things full from ſuch as are empty: thus we chuſe Caſſia, which ſhaken, makes no noiſe with the grains or ſeeds rattling in it. Hitherto we have explained the firſt, ſecond, third, and fourth faculty of Medicins in general, and have

ſhewed

shewed how they may be found out: now must we more particularly treat of their second and third faculties, because by reason of those they chiefly come into use in Surgery. Yet let me first briefly shew by what means and arts they may be prepared.

CHAP. VIII.

Of the Preparation of Medicins.

TO prepare Medicins, is nothing else, then by Art to make them more commodious for Use and Composition; whereby they are either made,

More gentle.

By *Bruising*; as when Medicins are broken by striking and rubbing or grinding in a Mortar, and that either of Brass, Iron, Lead, Glass, Wood, Marble, and other like; Considering the thing which is to be beaten, the strength or force wherewith it must be performed, the time or space, the situation, the things to be added, the consistence which the thing beaten must be of.

More strong.

By *Searsing*; whereby we separate the Purer and Finer from the more Impure and Gross, which is done by Sieves and Searses made of Wood, Parchment, Horse-hair, Silk, Lawn. Wherein is to be noted, that the same consideration is to be had in Searsing, as in beating: therefore such things as are to be finely powdered, must be searsed in a finer Searse; such as are more gross, in a coarser.

More pleasant.

By *Dissolving* or *Mollifying*; which is nothing else but a dissolving of a Simple or a Compound Medicin 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 Vinegar, Water, Wine, Juice of Limmons, &c.

More wholsom.

By *Desiccation* or *hardning*; which is nothing else 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 else but the tempering or macerating of a Medicin a little beaten or cut, in some liquor appropriate and fit for our purpose; as in Milk, Vinegar, Water, Oil, and the like, so long as the nature of the Medicin requires. To Infusion, Nutrition may be reduced, which is nothing else but as it were a certain accretion of the Medicin, by being moistned, macerated, rubbed, or ground with some moisture, especially with heat. By *Burning*; that is, by consuming the humidity which is in them. And that, either that they may be the better powdered, being otherwise too glutinous, or that they may lay aside their gross essence, and become of a subtiler temper; or that they may put off, or partly lose some fiery quality, as Acrimony, *Gal. lib. 4. cap. 9. Simplicium.* Or that they may acquire a new colour. Now all things are burnt, either alone; as such things as have a fatty moisture, as Hairs, sweaty Wooll, Horns: or else with some combustible matter, as Sulphur, Alum, Salt, Barley, &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 we may increase the weak faculties of such Medicins as are boiled, by boiling them with such as are stronger; or else to weaken such as are too strong, or else wholly to dissipate such as are contrary: Or that one faculty may arise of sundry things of different faculties being boiled together, or for the longer keeping them, or bringing them to a certain form or consistence: All which are done, by Fire, or Sun. By *Washing* or *Cleansing*; whereby the impurity of the Medicin is wasted away or cleansed; and such things are either hard, as Metals, Stones, parts of living Creatures, condensed Juices, and other like: Or soft, as Rosins, Gums, Fats, Oils. And these ought first to be finely beaten, that the water may penetrate in all their substance. Or to be dissolved, and cast into the Vessel filled with Water, and so stirred, and then suffered to subside, so that the Fat may swim aloft. And this must be done so long that the Water retain nothing thereof in colour, smell, or taste.

CHAP. IX.

Of Repelling or Repercussive Medicins.

Astringents are understood by the name of Repellers.

The differences of Repercussives.

REpelling or Repercussive Medicins are cold, and of gross and earthy parts; by which name also astringent Medicins are understood, because they hinder the falling down of the humours upon the part. Repercussives are such, either of their nature, and of themselves, or else by accident, being not such of their own nature. These which of themselves are such, are of two kinds; for some are watrish and moist, without any astrictive faculty which almost wholly proceeds from an earthy essence; wherefore that faculty of Repelling which they possess, they have it wholly from coldness. Of this kind are Lettuce, Purslain, Sow-Thistle, Ducks-meat, Kidney-wurt, Cucumers, Melons, Gourds, House-leek, Mandrake-apples, Night-shade, Henbane, and the like, which cool powerfully, and unless they be taken away before the part wax blackish, they extinguish the natural heat. Othersome are of an earthy essence, and therefore astrictive; but yet some of these are hot, othersome cold. Such things as are cold of temper, and of an earthy consistence, are properly and truly called Repellers. Of these some are Simple, othersome Compound: the Simples are Plantain, Vine-leaves, Leaves of Roses, Oaks, Brambles, Cypress,

preſs, Berberies, *Sumach*, all unripe Fruits, Verjuice, Vinegar, red Wine, the juice of ſower Pomgranats, *Acoeis*, the Juice of Berberies and Quinces, *Hypociſtis*, Pomgranat Pills, Oak-bark, the Flowers of Wild Pomgranats, the Meal of Barley, Beans, Panick, Oats, Millet, *Orobus* mixed with Juices in form of a Pultis, Bole-armenick, *Sanguis Draconis*, Ceruſs, Litharge, *Terra Sigillata*, Fullers-earth, Chalk, Marl, the Load-ſtone, Lead, Corals, all Marchaſites, Antimony, *Spodium*, true *Pompholyx*, all ſorts of Earth, and other things of the like nature.

Now Compound things are, *Oleum roſaceum, omphacinum, myrtillinum, papaveris, cydoniorum, nenuphar. unguentum roſatum, album rhaſis, camphoratum, emplaſtrum diacalcitheos*, diſſolved in vinegar and oil of Roſes, *deſiccativum rubrum, populeon, emplaſtrum nigrum ſeu tetrapharmacum* of *Galens* deſcription, *empl. contra ruptutam, de ceruſa, pro matrice.* All ſuch cold repercuſſives are more effectual if they be aſſociated with tenuity of ſubſtance, either of themſelves, or by mixture with ſome other things; for to this purpoſe we often mix Vinegar, Camphire, and the like things of ſubtil parts, with repercuſſives of groſs parts, that they may ſerve as vehicles to carry in the repercuſſive faculty. Repercuſſives of groſs parts and hot, are Wormwood, Centaury, Gentian, Agrimony, Savin, Coriander, Mint, Bay-leaves, Cardamomes, *Calamus aromaticus*, Aloes, Spikenard, Saffron, Nutmeg, Cinnamon, Amber, Salt, Alum, Coporas, *Sulphur, Oleum abſynthinum, Maſtichinum, Nardinum, Coſtinum, Ceratum, Gal. Stomachicum, Santalinum, Emplaſtrum Diacalcitheos.* But ſuch things as repel by accident, are Bandages, Compreſſers, Linnen cloths, and Rowlers of all ſorts, Caſes, Cauteries, Bloud-letting, Cupping, painful Friſtions in the oppoſite parts, and other ſuch like things as are properly ſaid to make révulſion. The uſe of repercuſſives is to force back the humour which flows from any other place into the part, and thus they mitigate the heat of ſuch inflammation as that defluxion of humours hath cauſed, yea, oftimes to aſſwage and help pain, the Fever, Abſceſs, malign ulcers and mortification. Such repercuſſives muſt always be ſo oppoſed to the diſeaſe, that reſpect may be 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 ſome parts whereunto we may by no means apply repercuſſives, as the groins, arm-pits, and thoſe glandules or kernels which are behind the ears and brain, leſt the humour ſhould retire back into ſome 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 manly and vigorous bodies may. Beſides, every diſeaſe requires not repercuſſives; for if the body be replete with ill humours, if it be plethorick, the uſe of repercuſſives, unleſs after general purgation, cannot be ſafe; as neither if the humour which is in motion ſhall be venenate, groſs, acrid, critical, or ſhall cauſe great pain in the part, for then on the contrary we muſt rather make uſe of attractives. But now if the diſeaſe be great, weak repercuſſives will avail nothing againſt it, as Lettuce againſt a great inflamation; 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 ſtopt, whereby the inflamation is increaſed, or elſe brought to a *ſcirrhus*. Wherefore let the Surgeon have a care that he temper the force of his Repercuſſives according to the magnitude of the diſeaſe.

Why things of ſubtil parts are oft-times mixed with repercuſſives.

Repellers by accident.

When and to what parts repercuſſives muſt be applied.

CHAP. X.

Of attractive Medicins.

AN attractive Medicin is contrary to the repeller; the Greeks call it *Helcticum*, it is of a hot and thin ſubſtance, whereby it draweth forth into the ſuperficies of the body that which lieth hid in the center, although ſometimes it doth it by an occult quality, otherwhiles by accident, as by the acrimony. Thoſe things which by a manifeſt quality do attract, are either Simple or Compound.

What an attractive Medicin is.

The Simple are, *Bryonia, allium, cepa, porrum, ariſtolochia, hermodactyli, cyclamen, lilium, ſigillum beatæ Mariæ, arum, aſarum, aſphodelus, gentiana, pyrethrum, ruta, ſabina, calamentum, omnes tithymalloides ſpecies, viſcum, abrotonum, anagallis, urtica, ranunculus, ſtruthium*, and ſuch like; *Ammoniacum, bdellium, galbanum, ſagapenum, euphorbium, aſphaltum, cinis è face 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 vero, 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, mithridatum, empl. de meliloto, diachilon magnum & parvum, oxycroceum, divinum.*

Attractives by a manifeſt quality.

Thoſe things which draw by a ſecret property in Nature, as are the Load-ſtone, Quick-ſilver, Piony, Amber, all Antidotes and Triacles that are remedies againſt the bitings of venomous Beaſts, and all purging Medicins.

By an occult.

Thoſe which draw by accident, perform it otherwiſe than of their own Nature; they have that quality out of putrefaction and corruption, as Doves dung, Goats dung, Cows dung, Mans dung, and all kind of dungs: alſo Leven, old Cheeſe, and ſuch like.

By accident.

Cupping-glaſſes, Leeches, Syringes, rougher and harder Friſtions, Sucking, Pain, ſtraight Ligations, Cauteries, do alſo draw, but after a different manner from them ſpoken of before.

Attractive Medicins muſt neither burn nor diſcuſs, and being very ſtrong and ſharp, they ſhould be tempered and mixed with Oil of Roſes, and other lenitives: but to weak ones ſhould be added Oil of Bays, *Calx viva*, and ſuch like to ſtrengthen them. The uſe of attractives is to draw poiſon toward the skin, and to haſten forward critical abſceſſes; 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 lies hid in the nerves 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 inflamations.

Their uſe.

CHAP.

CHAP. XI.

Of resolving Medicins.

What a Resolving Medicin is. The differences thereof.

THat is called a resolving Medicin which by heat, and the tenuity of his substance openeth the pores, attenuates the humours, dissipates and discussseth by evaporating the unprofitable matter. There are two sorts of these kinds of Medicins, the ones is called *Araeoticum*, or rarifying, the other is termed *Diaphoreticum*, or digesting.

The *Araeoticum* by a mean heat, and not dry, and indued with a tenuity of substance, openeth and relaxeth the skin, and draweth forth the matter shut up under it, whereby it may ease pain, like as Anodynes, because it doth not much depart from a temperate heat.

But the *Diaphoreticum* being much hotter, whatsoever sticketh in the part being there impact, it doth by thin vapour insensibly dissipate: therefore the acrid and hot things are in this case to be made use of rather than attractives, because that cold and grosness is more difficultly to be digested, and the length and involution of the ways being to be considered. The *Araeotick*, which we may call weak Resolvers, are either Simple or Compound.

The Simples are these, *Bismalva tota, parietaria, adiantum, mercurialis, ebulus, valeriana, rosmarinus, salvia, thymus, chamaemelum, melilotum, anethum, farina hordei, tritici, seminis lini, fænugraeci, nigella, furfur, adeps gallinæ, anseris, anatis, cuniculi, vituli*; almost all Metals unless such as are acrid. The Compounds are, *Oleum chamaemolinum, anethinum, liliaceum, catellorum, lumbricorum, Keirinum, de vitellis ovorum, de tritico, amygdalarum dulcium, unguentum de altheæ, empl. diachylum, ireatum.* Diaphoreticks or digestives, are also both Simple and Compound: The Simple are *Aristolochia, enula campana, iris, cepa scyllæ, sigillum Salomonis, sigillum Beatæ Mariæ, bryona, panis porcinus, dracunculus, asphodelus, origanum, mentha, pulegium, sabina, serpillum, calamentha, hyssopus, urtica, artemisia, lavendula, chamæpitys, anisum, fœniculum, 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, styrax, calamita, benjoinum, stercus caprinum, columbinum, caninum, bubulum, & aliæ stercorum species.* Compound Diaphoreticks are, *Oleum amygdalarum amararum, juniperinum, laurinum, de scorpionibus, irinum, collinum, nardinum, de terebinthina, de croco, canabicum, raphanimum, è cucumere agresti, vulpinum, rutaceum, philosophorum, de lateribus, de euphorbio, de tartaro, de petroleo, de kerva, sive vecininum unguent. Arippæ, aragon, martiatum, enulatum, empl. de Viga*, without addition, and with addition, *oxycroceum, diacalcitheos*, dissolved in a digesting oil to the form of a cerot.

Araeoticks are profitably used in the increase and state of superficial tumours.

The use of Diaphoreticks

But *Diaphoreticks* are not to be used in the increase of tumours, unless some astringent be added, lest by their more strong digestion, they should draw and increase the defluxion: but when the tumors decline, they are then onely to be used in the parts chiefly where the skin is dense and hard, and when the tumor is cold and gross, and lying hid deep in the body, so that the virtue of Medicaments can hardly come thereto: but consideration is to be had of the parts to which resolutives are to be applied; for you may not apply Relaxers or Diaphoreticks to the Liver, Spleen, Stomach, or Bowels, unless you add some astringents, of which a great part must be Aromaticks.

To the parts where sense is more dull, may be applied the stronger Diaphoreticks; but those parts which are endued with a more exquisite sense, as the Eye and the Nerves, to them we must apply weaker. When the matter is gross and cold, things cutting and attenuating, and then emollient are to be used, and so by degrees come to diaphoreticks; otherwise that onely is resolved which is the most subtil of unprofitable matter, the grosser becoming concrete and hardned. But if the part be afflicted with a continual defluxion, so that there may be danger of a Gangrene or Sphacel, it is not lawful then to make use of Resolvers, but you must in the place where the humour flows, divide the skin by scarification, as it is most learnedly noted by *Hollerius*, in that profitable Book of his left to posterity, whose Title is, *De Materia Chirurgica.*

CHAP. XII.

Of Suppuratives.

What a Suppurative Medicin is.

A Suppurative Medicin is said to be that, which shutting the pores, and preventing transpiration by his emplastick consistence, increaseth the matter and 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 being exhaled; in which respect it differeth from emollients and malacticks, of which we shall speak hereafter. There be two kinds of Suppuratives: for some do it of themselves, and by their proper quality; others by accident. Those things which by their own strength do bring to suppuration, are either Simples or Compounds.

Differences of Suppuratives.

Simples are, *Radix liliorum, cepa, 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 excorticati, lolii, seminis lini & fœnugraeci, galbanum, ammoniacum, styrax pinguis, ladanum, viscum aucupatorum, thus, pix, cera, resina, colla, adeps suillus, vitulinus, vaccinus, caprinus, butyrum, vitellus ovi, aspus humida, stercus suillum, columbinum, caprinum, pueri.* Compounds are, *Oleum liliorum, lumbricorum, de croco, unguent. basilicum, emplast. diachilon commune, magnum, de mucilaginibus.*

Suppuratives by accident.

Those things do suppurate by accident, which work it onely by the means of an Emplastick consistence

ſtence: for ſo oft-times aſtringents, becauſe they are of earthy and thick parts, are found to ſuppurate; ſuch are *unguentum de bolo nutritum*, and ſuch like. Such alſo are thoſe which by their coldneſs keep the heat in, and ſhut the pores. Hence it is that the qualities of Sorrel are commended to generate *pus*: for whileſt it keepeth the heat within, it increaſeth his effects, to the thickning of the ſuppurable matter, and the overcoming other rebellious qualities. We uſe things ripening in great inflammations, whoſe growth we cannot hinder with Repellers, or increaſe with Reſolvers or Diſcuſſers.

CHAP. XIII.

Of Mollifying things.

THat is defined to be a mollifying Medicin, which by a ſtronger heat than that which is proper to ſuppuratives, without any manifeſt quality of drying or moiſtning, again malaxeth or ſofteneth hardned bodies: wherefore this differs from that which ſuppurates, becauſe that they be hot in the firſt or ſecond degree, according to the ſeveral tempers of the body, or part to which it is applied, working rather by the quantity of heat, than the quality; contrariwiſe, that which mollifieth being indued with a greater heat, rather worketh by the quality of the heat, being otherwiſe in drineſs and moiſture temperate. *Gal. cap. 7. lib. 5. ſimp.* How Suppuratives and emolliens differ.

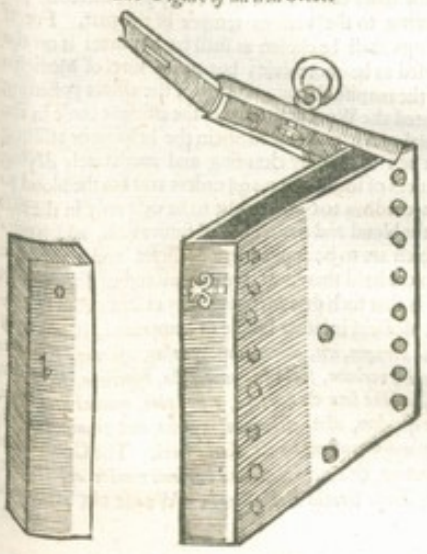
Although as many things agree together in ſome reſpects, though of a diverſe nature, ſo many emollients are ſuch as are hot in the firſt degree, and drie in the ſecond and third, that ſo they may the better diſperſe and diffuſe that which is congealed, by taking away a little of the humidity, which is contained within the part affected: but not by exhauſting it wholly by the violence of heat or drineſs: for hereon would follow a greater hardneſs.

Things mollifying, are either Simple or Compound, and thoſe again ſtrong or weak. The weak are, *Radix liliorum alborum, cucumeris agreſtis, althææ, folia malvæ, biſmalvæ, liliorum, anethi ſummitates, viola, branca urſina, ſemen malvæ, biſmalvæ, lini, fœnugræci, carici pingues, paſſulæ mundatæ, pedum, capitum, inteſtinorum vervecinorum decoctum, adeps ex juvenibus & caſtratis domeſticis, ſeminis 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 emollients are, *Æſtum, adeps taurinus, urſinus, cervinus, leoninus, pardalinus, apri, equi ſevum, pinea, picea, abietina, terebinthina, ammoniacum, bdellium, ſtyrax, galbanum, ladanum, propoli, opopanax, ung. de althæa, emp. diachylon commune & magnum, de mucilaginibus, ceroneum, cxyceroeum Joannis de Vigo.* The differences of emollients.

We uſe emollients in ſcirrhous tumours of the muſcles, or in the lips of Ulcers, in any of the limbs, belly, glandules, bowels, by reaſon of a groſs, cold, and viſcous matter, either phlegmatick or melancholick. Yet thoſe tumors which come of melancholy, commonly turn to Cancers, which are exaſperated by mollifying things. On the contrary, ſuch as proceed from a phlegmatick matter, are brought to an equality of conſiſtence, by the uſe of emollients. Furthermore, there are three things obſervable in the uſe of emollients: the firſt is duly to conſider how much the affected part differs from his proper and natural temper and proportion, that ſo we may apply an equivalent remedy. The ſecond is, that we diſtinguiſh the natures of the parts. The third is, that we artificially gather after what manner this mollifying muſt be performed; that is, whether we ſhould mingle with the emollients deterſive or diſcuſſing Medicins. For there are many deſperate ſcirrhous tumours, that is, ſuch as cannot be overcome by any emollient Medicin, as thoſe which are grown ſo hard, that they have loſt their ſenſe; and thereupon are become ſmooth and without hairs. Here you muſt obſerve that the part ſometimes becomes cold in ſo great an exceſs, that the native heat plainly appears to languiſh, ſo that it cannot actuate any Medicin. That this languiſhing heat may be reſuſcitated, an iron ſtove ſhall be ſet near to the part, wherein a good thick piece of iron heated red hot ſhall be incloſed, for ſo the Stove will keep hot a long time. Their uſe.

Things obſervable in the uſe of emollients.

The Figure of an iron Stove.



A *The caſe of the Stove.*
B *The iron Eat to be heated.*
C *The lid to ſhut the Stove.*

CHAP. XIV.

Of Deterfives, or Mundificatives.

A Deterfive is defined to be that which doth deterge or cleanſe an ulcer, and purge forth a double kind 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 efficacious quality of the Medicins; the other is more thin and watery, which the Greeks call *Ichor*, the Latins *Sanies*, which is taken away by the drineſs of the Medicin; and therefore *Hippocrates* hath well adviſed that every ulcer muſt be cleanſed and dried.

Deterfives. Of Deterfives, ſome are ſimple, ſome compound, ſome ſtronger, ſome weaker. The ſimple are either bitter, ſweet, or ſowre: the bitter are *Gentiana, Ariſtolochia, iris, enula, ſcylla, ſerpentaria, centaurium minus, abſynthium, marrubium, perforata, abrotonon, apium, chelidonium, ruta, hyſſopus, ſcabioſa, artemiſia, eupatorium, aloe, fumus terræ, hedera terreſtris*; a *Lixivium* made with the aſhes of theſe things, *Lupini, orobus, amygdala amara, faba, terebinthina, myrrha, maſtiche, ſagapenum, galbanum, ammoniacum*, the galls of Beaſts, *ſtercus caprinum, urina bene cocta, ſquama æris, æs uſtum, ærugo, ſcoria æris, antimonium, calx, chalcitis, miſy, ſory, alumen*. The ſweet are *Viola, roſa, meliletum, ficus pingues, dactyli, uvæ paſſæ, glycyrrhiza, aqua hordei, aqua muſſa, vinum dulce, mel, ſaccarum, ſerum lactis, manna, thus*. The ſharp are all kind of ſowre things, *Caprioli vitium, acetum*, and other acid things. The Compound are, *Syrupus de abſynthio, de fumaria, de marrubio, de eupatorio, de artemiſia, acetoſus, lixivium, oleum de vitellis ovor. de terebinthina, de tartaro, unguentum mundificativum de apio, apoſtolorum, pulvis mercurialis*. We uſe

Their uſe. ſuch things as deterge, that the ſuperfluous matter being taken away, Nature may the more conveniently regenerate fleſh to fill up the cavity: But in the uſe of them, conſideration is firſt to be had of the whole body, whether it be healthy, plethorick, or ill diſpoſed; there is conſideration to be had of the part, which is moiſter and drier, indued with a more exquiſit or duller ſenſe. But oft-times acidents befal ulcers beſides nature, as a *Callus*, a defluxion of a hot or otherwiſe malign humour, and the like ſymptoms. Laſtly, conſideration is to be had, whether it be a new or inveterate ulcer; for from hence, according to the Indication, remedies are appointed different in quantity and quality: ſo that oft-times we are conſtrained to appoint the bitter remedy in ſtead of the ſweet. Neither truly with a painful and drie ulcer doth any other than a liquid deterſive agree: neither to be moiſt any other than that of a drie conſiſtence, as Powders.

CHAP. XV.

Of Sarcoticks.

No Medicin truly Sarcotick. THat Medicin is ſaid to be Sarcotick, which by its drineſs helps Nature to regenerate fleſh in an ulcer, hollow, and diligently cleanſed from all excrements. But this is properly done by bloud indifferent in quality and quantity. Wherefore, if we muſt ſpeak according to the truth of the thing, there is no Medicin 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 endeavour of Nature in generating of fleſh. For as by the Law of Nature, from that nouriſhment which flows to the nouriſhing of the part, there is a remain, or a certain thin excrement, flowing from ſome other place, called by the Greeks *Ichor*, and by the Latins *Sanies*. Thus by the corruption of the part there concretes another groſſer excrement, termed *Rypos* by the Greeks, and *Sordes* by the Latins. That makes the ulcer more moiſt, this more filthy. Hence it is, that every wound which requires reſtitution of the loſt ſubſtance, muſt be cured with two ſorts of Medicins, the one to drie up and waſte the ſuperfluous humidity thereof, the other to fetch off the filth: and by how much the wound is the deeper, by ſo much it requires more liquid Medicins, that ſo they may the more eaſily enter into every part thereof.

But diverſity of things ſhall be appointed according to the various temper of the part. For if the affected part ſhall be moiſt by Nature, ſuch things ſhall be choſen as ſhall be leſs drie: if on the contrary the part be drie, then ſuch things ſhall be uſed as be more drie; but many ſorts of Medicins ſhall be aſſociated with the ſarcoticks, according to the manifold complication of the affects poſſeſſing the ulcer. Therefore Nature onely is to be accounted the Workmaſter, and the efficient cauſe in the regenerating of fleſh, and laudable bloud the material cauſe, and the Medicin the helping or aſſiſting cauſe, or rather the cauſe without which it cannot be: as that by cleanſing and moderately drying without any vehement heat, takes away all hinderances of incarnation, and orders and fits the bloud to receive the form of fleſh. This kind of Medicin according to *Galen*, ought to be drie only in the firſt degree, leſt by too much drineſs it might drink up the bloud and matter of the future fleſh, which notwithſtanding is to be underſtood of Sarcoticks which are to be applied to a delicate and temperate body. For if the ulcer be more moiſt, or the body more hard than is fit, we may aſcend to ſuch things as are drie even in the third degree. And hence it is that ſuch drie Medicins may firſt be called Deterfives, and then preſently Sarcoticks. A Sarcotick Medicin is either ſimple or compound, ſtronger or

Simple Sarcoticks. weaker. Simple Sarcotick Medicins are, *Ariſtolochia utraque, iris, acorus, draconculus, aſarum, ſymphyti omnia genera, betonica, ſanicula, millefolium, lingua canis, verbena, ſcabioſa, pimpinella, hypericon, ſcordium, plantago, rubia major & minor, eorumque ſucci. Terebinthina lota & non lota, reſina pini, gummi arabicum, ſarcocolla, maſtiche, colophonia, manna, thuris, cortex ejuſdem, aloe, olibanum, myrrha, mel, vinum, ſanguis*

Compound Sarcoticks. *draconis, lithargyros, auri, ſtodium, pompholyx, tutia, plumbum uſtum lotum, ſcoria ferri*. The Compound Sarcoticks are, *Oleum hypericonis, ol. ovorum, maſtichinum, & cætera olea, quæ balſami nomine appellantur, unguentum aureum, emp. de betonica, Vigonis de janua, Emp. Gratia Dei, nigrum*. We uſe not Sarcoticks

before

before that the ulcer be cleanſed and freed from pain, defluxion, inflammation, hardneſs, and diſtemper. In uſing theſe things we conſider the temper of the body, and the affected part: For oftimes a part otherwiſe leſs dry by nature, requires a more powerful drying medicine, and ſtronger ſarcotick, than another part which is more dry, and this for ſome other reaſon, which ought to come into our conſideration: For example, the glans would be more dried than the prepuce, although it be of a temper leſs dry, becauſe it is the paſſage of the urine. Wherefore we muſt diligently obſerve the condition of the affected parts, and thence taking indication, make choice of more ſtrong ſarcoticks. Foth both that which is too little, and that which is too much ſarcotick, makes a ſordid ulcer: the firſt becauſe it dries not ſufficiently; the latter for that by its acrimony it cauſeth defluxion. Therefore diligent care muſt be uſed in the examination hereof.

CHAP. XVI.

Of Epuloticks, or skinning medicines.

AN Epulotick medicine is that which covereth the part with skin: it is ſaid to be ſuch as by drineſs and aſtriction without biting deſiccates, binds, and condenſates the fleſh into a certain callous ſubſtance, like to the skin, which we commonly call a cicatrice or ſcar: yet this, as the generating of fleſh, is the work of nature. A medicine therefore is ſaid to be Epulotick, for that it aſſiſts nature in ſubſtituting and generating a ſcar, in ſtead of the true skin, whilſt it conſumes the ſuperfluous humidities, condenſates, incraſſates, and binds the next adjacent fleſh: therefore it ought to dry more powerfully than a ſarcotick. Epulotick medicines are of three kinds: the firſt is the true epulotick, which onely dries and binds. The ſecond is an acrid and biting epulotick, which, for that it waſtes the proud fleſh, is called ſo; and this muſt be ſparingly uſed, and that only to hard and ruſtick bodies. The third is that which only dries 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 & ſymphyti folia, gallæ, baccæ myrti, glandes & earum calices, balauſtia, cupreſſi nuces, malicorium, cortex quercus, cortex tamaricis, cortex ligni aloes, acacia, colophonia, ſarcocolla, ſanguis draconis, ladanum, lithargyros auri, argenti, ceruſa, plumbum uſtum, alumen uſtum, tuthia, ſquamma æris & ferri, & eorum ſcoria, æruga, flos æris, æs uſtum & lotum, ſulphur vivum, chryſocolla, corali, bolus armenus, terra ſigillata, cineres buccinarum, oſtreorum, ſilicis, oſſa uſta & ſiccata, caries lignorum, ung. diapompholygos, ung. alb. rhaſis, deſiccativum rubrum, emp. de ceruſa, de betonica, diacalcitheos, emp. nigrum.* Three ſorts of Epuloticks.

We uſe Epuloticks when as the ulcer is almoſt filled up, and equal to the adjacent skin. In the uſe of theſe we muſt alſo have reſpect to the tenderneſs and hardneſs of the body; for ſuch things as are corroſives to tender and delicate bodies, are epulotick to hard and ruſtick bodies. Alſo we muſt have regard, whether the body be plethorick, or replete with ill humours, for ſuch do not eaſily admit cicatrization. Alſo it is moſt worthy of your obſervation, to mark whether the ulcer that is to be cicatrized be fed or nouriſhed by the preſent defect of any part, as the liver, ſpleen, lungs, or a *varix* lying about it. for it cannot be cicatrized before theſe impediments (if any ſuch be) be taken away. Laſtly, the callous lips of an ulcer, unleſs they be ſcarified or ſoftened, hinder cicatrization. Therefore all ſuch defaults muſt be taken away, and then ſuch an epulotick applied, as may not by the too much drineſs leave the ſcar too hollow, or the too little, leave it too high. Their uſe.

CHAP. XVII.

Of Agglutinatives.

AGglutinating or agglutinative medicine is of a middle nature, between the ſarcotick and epulotick, more ſtrong than the former, and weaker than the latter, for it is dry to the ſecond degree. It by the drying and aſtrictive faculty, void of all deterſion, conjoins parts parts that are diſtant, or rather lends helping hands to nature the principal agent in this work. Glutinatives, whether they be ſtrong 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, attractilis, folia quercus & draconculi, ſalix, ebulus, ſambucus, pentaphyllon, veronica, cortex pini, ulmi, palmæ quercus. Aqua vitis, aq. e folliculis ulmi, ſuccus calaminthæ, vinum auſterum, terebinthina, myrrha, ſanguis draconis, bolus armenus, terra ſigillata, omnia denique acerba.* Agglutinative medicines.

Glutinatives by accident are thoſe that hinder defluxion, and bind the part, as Sutures, Bandages, Reſt, Rowlers, and the like. We uſe glutinative in green, and as yet bloudy wounds, whence the Greeks call a glutinative medicine *Enæma*, although ſometimes they are uſed to inveterate, malign, fiſtulous and ſinuous ulcers; for they hinder the defluxion from coming to the lips of ulcers. You muſt conſider, when as you intend to apply them, whether the skin be whole or no: For ulcers knit together, or heal more difficultly, if the skin be rubbed off, or cut, or otherwiſe loſt. Neither ought you to be unmindful of the forementioned cautions and indications drawn from the ſex, the tenderneſs or hardneſs of the affected body, the continuance and magnitude of the ulcer: for hence indication muſt be taken, what the quantity and quality of the medicin ought to be. Glutinatives by accident.

CHAP. XVIII.

Of Pyroticks, or caustick Medicines.

Three degrees of Causticks.

THat medicine is said to be Pyrotick or Caustick, which by its acrimony and biting, commonly consisting in an earthy consistence, either superficially corrodes, or more deeply eats and putrefies, or lastly, burns and consumes the skin and flesh, so that it even pierces into callous and hard bodies. Therefore there are three degrees of Pyroticks; for some are termed Cathereticks or corroding, for that they waste the proud flesh of an ulcerated or any other part, and these are judged the weaker sort of the Pyroticks. Others some are termed Septick or putrifying, as those which destroy and dissolve the tender and new sprung up flesh, and raise blisters in the skin, and these are more powerful than the cathereticks. Lastly, there are others some termed most powerful Escharoticks, which by their fiery and terrestrial quality cause 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 happens, that according to the different temper and consistence of the parts, according to the longer or shorter stay, a Cathertick may penetrate as far as a Septick, and on the contrary, an Escharotick may enter no farther than a Septick. These are judged

Cathereticks.

Septicks and Vesicatories.

Escharoticks. Their use.

Cathertick, *Spongia usta, alumen ustum & non ustum, vitriolum ustum, calx mediocriter lota, aruge, chalcanthum, squamma aeris, oleum de vitriolo, trochisci andronis, phasionis, assbodelorum, ung. Ægyptiacum, apostolorum, pulvis mercurii, arsenicum sublimatum.* Septicks and Vesicatories are, *Radix scillæ, bryoniæ, sigill. beatæ Mariæ, bugloss, 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 contrary to nature. Escharoticks or Causticks are, *Calx viva, fex vini exemata & præpue aceti, ignis,* whereto are referred all Cauteries, as well actual as potential, whereof we shall treat hereafter. We use Cathereticks in tender bodies, and diseases not very 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 troublesome by delay; but we use Septicks, and sometimes Escharoticks in ulcers that are callous, putrid, and of inexhausted humidity, but principally in Cancers, Carbuncles, and excessive Hæmorrhagies. When as we make use of these, the patient must have a convenient diet appointed, must abstain from wine: lastly, they must not be used but with great discretion; for otherwise they may cause Feavers, great inflammations, intolerable pains, Swounings, Gangrenes, and Sphacels. Cauteries heedfully used, strengthen and dry the part, amend an untameable distemper, dull the force of poyson, bridle putrefaction and mortification, and bring sundry other benefits.

CHAP. XIX.

Of Anodynes, or such as mitigate or asswage pain.

What pain is.

BEfore we treat of Anodyne medicines, we think it fit to speak of the nature of pain. Now pain is a sorrowful and troublesome sense, caused some sudden distemper, or solution of continuity. There are three things necessary to cause pain; The efficient cause, that is, a sudden departure from a natural temper or union: the sensibleness of the body receiving the dolorifick cause: lastly, the apprehension of this induced change, caused either by distemper or union; for otherwise with how exquisite soever sense the body receiving the causes indued with, unless it apprehend and mark it, there is no pain present. Hence is that Aphorism of *Hippocrates, quicunq; parte aliqua corporis dolentes dolorem omnino non sentiunt, his mens ægrotat,* that is, Whosoever pained in any part of their bodies do wholly feel no pain, their understanding is ill affected and depraved. Heat, cold, moisture, and driness, induce a sudden change of temper; and heat and cold cause sharp pain, driness moderate, but moisture scarce any at all: for moisture causeth not pain so much by its quality, as it doth by the quantity. Both the forementioned qualities, especially associated with matter, as also certain external causes too violently assailing, such as these that may cause 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 causes of pain, or dulling the sense of the part. Hereupon they make three differences of Anodynes: For some serve to cure the disease, others some to mitigate it, others some stupifie, and are narcotick. We term such curative of the diseases, which resist, and are contrary to the causes of diseases. Thus pain, caused by a hot distemper, is taken away by oil of Roses, Oxycrate, and other such like things, which amend and take away the cause of pain, to wit, the excess of heat. Pain caused by a cold distemper, is amended by *Oleum Laurinum, Nardinum, de Castoreo.* Pain occasioned by too much driness, is helped by *Hydrelæum,* a bath of fresh and warm water. Lastly, by this word Anodyne, taken in the largest sense, we understand all purging medicines, Phlebotomy, Scarification, Cauteries, Cuppings, Glysters, and other such like things as evacuate any store of the dolorifick matter. But such as are properly termed Anodynes, are of two sorts: for some are temperate, others hot and moist in the first degree, and consequently near to those that are temperate: these preserve the native heat in the proper integrity, thus they amend all distemperatures; of this kind 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 facility overcome the cause of pain: besides also, they rarifie, attenuate, digest, and consequently evacuate both gross and viscid humors, as also cloudy flatulencies hindred from passing forth: such are *flores chamæmeli, meliloti, crocus, oleum chamæmelinum, anethinum, oleum lini, oleum ex semine altheæ, lumbricorum, ervorum, ex tritico, butyrum, lana succida, sullus adeps, vitulinus, gallinaceus, anserinus, humanus, ex anguilla cuniculo,*

What properly termed Anodynes are.

cuniculæ, & aliis. Lac muliebre, & vaccinum, mucago seminis lini, fœnugræci, althææ, malvæ, vel ejusmodi seminum decoctum: as also *Decoctum liliorum, violariæ, capitis, pedum, & intestinorum arietis & hœdi.*

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 spirits to the part, whence it is that they take away sense: of this sort are *hyoscyamus, cicuta, solanum manicum, mandragora, papaver, opium, arthritica vincula.* Narcotick improperly termed Anodynes.

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 very contumacious, that by their application we may resist defluxion, inflammation, the feaver, 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 we come to the third sort of Anodynes. Yet oft-times the bitterness of pain is so great, that very narcoticks must be applied in the first place, if we would have the part and the whole man to be in safety. Yet the too frequent use of them, especially alone without the addition of saffron, myrrh, *castoreum*, or some such like thing, useth to be very dangerous: for they extinguish the native heat, and cause 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 be sooner mitigated by opening a vein, purging and scarifying the part affected, than either by properly termed anodynes or narcoticks, to wit, that pain may be the remedy of pain. By purgers we here understand not only such as taken by the mouth, produce that effect; but also such as outwardly applied perform the same, as those whereof *Actius* makes mention, As The use of them.

℞. *Pulpæ seu medul. colocynth. semin. eruc. rut. sylvest. elaterii, gr. cindii, lathyrid. expurgatar. galban. nitri, ceræ, singulorum,* ℥iv. *opopan.* ℥ij. *terebinth.* ℥vj. *terenda terito, & taurino felle paulatim irrigato, donec apte imbibantur.* Then apply it about the navel even to the share, for thus it will purge by stool; if on the contrary you apply it to the bottom of the stomach, it will cause vomit. Another; ℞. *elaterii* ℥iij. *colocynth. squammæ æris radic. cucumer. agrest. lathyrid. an.* ℥j. *aut pro lathyrid. tithymal. succum terito & cribrato, at cum oleo plurimum salis habente subigito, magnam inde pilam e lana confectam hoc medicamento illitam, umbilico aut lumbis applicato.* Or, ℞. *fellis taurin.* ℥j. *gr. cindii viridi.* ℥iv. *succi lupinor. viridi.* ℥ij. *euphorb.* ℥j. *pulp. colocynth. tantundem adip. vulpin. recent.* ℥vj. *adip. viper.* ℥ij. β. *sterc. muris,* ℥iv. *succi pæon. castor. singuler.* ℥iv *ol. lignstrin.* ℥vi. *ol. antiq.* ℥j. *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 quantity to be used at one time; for in some, one is sufficient: anoint therewith the navel and thereabouts, and a just purgation will ensue thereupon, which if it shall flie out beyond your expectation, you may foment the belly with a sponge moistened in warm wine and pressed forth again, it will be presently stayed. Moreover *Fernelius lib. 7. methodi*, makes mention of a laxative ointment. *Tetrab. 1. sem. 3 cap. 35.* Purgatives to be externally applied. The composition of a purging oil and ointment.

CHAP. XX.

Of the composition and use of Medicines.

HItherto we have spoken of the faculties of simple medicines; now we think good to say something of the compounding of them: for so by the Architect are had and known every thing apart, and then he settles the workmen to the building, the conceived form of which hath been in his mind ever since he 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, aloe, rosa, absynthium*, although they have divers substances and faculties, yet are notwithstanding called simple medicines, because they have that variety from Nature, not from Art. But we many times call simple such things as are compounded by art, as *oxym. simpl. oxysacch. simplex*, as compared to greater compositions. And therefore oftentimes we use compound medicines, because always the simple medicine alone, hath not strength enough to oppugn the disease. For many times the sick labour with manifold, and not simple affects, from which there being taken a various indication, we gather contrary simple medicines, to apply to every affect, in one composition. But oftentimes the nature of the part of the Patient, or of the body affected, requireth another kind of medicament which may be proper for the removing that disease; wherefore it is so made to oppugn the disease and not offend the body: and we mingle many other together, whose effects may temper one another. Moreover the composition of medicines was necessary, that because those things which have not a good taste, colour, or smell, by Art, or composition, might be 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, Cauterics, *Collyria*, *Errhina*, Sneezing-powders, Masticatories, Gargarisms, Dentifrices, Bags, Fumigations, Semicupiums, Baths. But first it is expedient that I say something 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 necessity of compound medicines.

CHAP XXI.

Of weights and measures, and the notes of both of them.

EVery 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 barly-corn or grain, and that such as is neither too dry, 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.

Obolus. A scruple. A dram. An ounce. A pound.

Ten grains of these make an *Obolus*; two Oboli, or twenty grains make a scruple, three scruples, or sixty grains make a dram, eight drams make one ounce, twelve 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, ℔. 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 we measure the quantity of medicines by measures and not always by weights; and therefore we express a handful by this note, m. a pugil thus, p. number thus, n. and the half part of every weight and measure is expressed by this note, ß. put after every note of the aforesaid weights and measures of the same sort, as the half pound, ℔ß. the half ounce, ℥ß. and so of the rest. Moreover, in describing the same medicament we use the notes sometimes of weights, sometimes of measures; and therefore it is to be noted that herbs, green or dry, are signed with these notes, m. p. but those which are dry and to be 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.

All other medicaments either dry or liquid, are described with these notes, ib. ℥. ʒ. ℈. obol. g.

Having expounded these things, let us come to the description of compound medicines, beginning with glysters first, as the remedy which is most common and familiar, and almost chiefly necessary of all others.

CHAP. XXII.

Of Glysters.

What a glyster is.

A Glyster is an injection prepared first and properly for the gross intestines and fundament; for sometimes glysters are used and made for the stomach, spleen, reins, bladder, womb, mesentery, and also for the head, from whence oftentimes by sharp glysters, the hurtful matter is brought downwards, as we see in Apoplexies. Therefore there is no part of the body which receives not some benefit by glysters, but more or less according to the vicinity they have with the belly, and the strength of the glyster: for there are divers sorts of glysters, some emollients, others evacuating, some anodynes, some astringents, some cleansing, some sarcotick, and epulotick, and some may be said to nourish. They may be all made of the parts of plants or beasts, with compound medicines either solutive, or altering, and others according to the advice of the Physician. The parts of plants which are used to this purpose, are roots, seeds, leaves, flowers, fruits, shouts, juices, mucilages. Parts of beasts are yolks of eggs and whites, hony, chickens, capons, old cocks well beaten, hands and feet of sheep, the intestines, whey, milk, sewet, axungia, and such like in decoctions, wherein we mingle and dissolve simple and compound medicines. We sometimes use without any 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 barly do we prepare Glysters.

Differences of glysters.

The materials of glysters.

Their quantity

The quantity of a Glyster is sometimes less according to the diverse disposition of men and their diseases: for weak children the quantity is less: for women with child, and in the colick, dysentery, lientery, or when much hardened excrement is within. But when we would abundantly move 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 be injected warm or hot, more or less, according to the nature or condition of the sick: for being cold it offends the intestines, and the neighbouring nervous parts, which are cold of themselves. It must be given by degrees, for being injected suddenly, the wind which is usually in the guts will beat it back again, whence comes intolerable pain. But this will be more clear by that we shall teach concerning the differences of glysters, whereof there shall be sufficient examples.

An emollient glyster.

℞. *malv. violar. bismalv. acanth. an.* m. j. *radic. alth. lilior. an.* ℥j. *passul. ficuum ping.* ℥ ß. *fiat decoctio ap.* ℔j. *in qua dissolve cass. butyr. recent. an.* ℥j. *ol. viol.* ℥iij. *fiat Clyster.*

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 be cold which are to be evacuated, the Glyster shall be after this manner.

A glyster to evacuate a cold phlegmatick humor.

℞. *Salviæ, origani, abrotoni, chamæm. melilot, an.* m. ß *seminum anisi, fœnic. cumini, an.* ʒiij. *semin. cathar.* ʒij. Make a decoction of them, wherein dissolve *Diaphon. Hier. Simpl. an.* ℥ß. *ol. aneth. chamæm. an.* ℥j. ß. *Mellis Attho. succ. rub. an.* ℥j. *fiat Clyster.*

To evacuate Cholerick matter, prepare a Glyster after this matter, ℞. *quat. remollient. paret. Cichor. endi. an.* m. ß. *Semen. quat. frigid. Major. an.* ʒiij. *hordei integri,* p. j. Make a decoction of them, and dissolve in it *Cass.* ℥j. *Ol. viol. mellis viol. an.* ℥ij. *fiat Clyster.*

To evacuate melancholy, this Glyster following will be useful. ℞. *Fumiter. Centaur. minoris, Mercurialis, an.* m. j. *Polyp. Qu. folicul. sennæ, an.* ʒiij. *seminis agni casti, Thymi, an.* ʒij. Make a decoction and dissolve therein *Confect. Hamech.* ℥ ß. *Cass. recens extract.* ʒiij. *olei violati, lilior. an.* ℥ß. *Sac. rub. mellis viol. an.* ʒjß. *salis,* ʒj. And those Glysters do not only evacuate the humors that offend, but also correct the distemper of the bowels and inward parts. For the Glysters prescribed against pituitous 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 very strong, as, *Confect. Hamech. Benedicta, Diaprun. Solutivum, Diaphenicon,* being used from ʒvj. to ℥j. at most: but the weaker and more gentle are *Catholicon, Cassia, Hiera simplex,* from ʒvj. to ℥ij. at most.

An Anodyne glyster.

An Anodyne Glyster is usually made without such things as purge or evacuate: as, ℞. *Flor. Chamæm. melil. Aneth. an.* p. j. *rad. Bismal.* ℥j. boil them in milk, and to the decoction add, *Mucaginis seminis lini, fœnugræci, extractæ in aqua Malvæ,* ℥ij. *saccari albi, olei anethi, chamæmeli, an.* ʒj. *vitellos ovorum*

ovorum duos, fiat Clyſter. Theſe Glyſters ſhould be kept longer in the body, that ſo they may more eaſily mitigate pain.

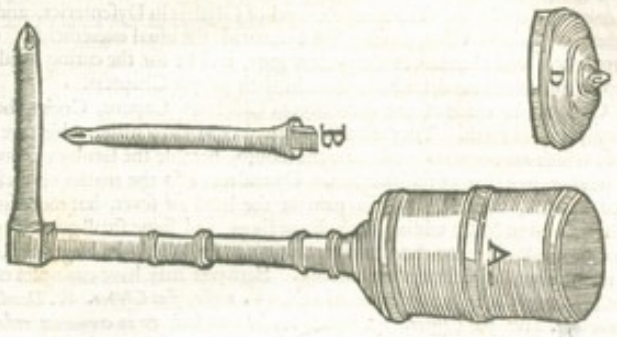
The example of an aſtringent Glyſter. R. *Equiſeti, plantag. polygoni, an.* m. j. boil them in *Laſte uſtulato*, to ℥xij. to the decoction ſtrained add *Bol. armeni, ſanguinis draconis, an.* ʒij. *olei roſati,* ℥ij. *albumin. ovorum duorum, fiat Clyſter.* We uſe theſe kind of Glyſters in Dyſenteries, and in the immoderate flux of the Hæmorrhoid veins, 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 be prepared of ſuch medicines as are deſcribed before in their proper Chapters. An Aſtringent Glyſter.

Alimentary Glyſters are made of the decoction of Chickens, Capons, Cocks, being boiled to a gelly, and ſtrongly preſſed forth. They are alſo prepared of Marrow gelly, which are not altogether ſo ſtrong as thoſe which are commonly taken by the mouth, becauſe the faculty of concoction in the guts, is much weaker than that of the ſtomach. Oftentimes alſo the matter of theſe kind of Glyſters is prepared in wine, where there is no pain of the head or fever, but more frequently in the decoction of Barly, and in Milk, adding the yolks of Eggs, and ſome ſmall quantity of white ſugar, left by the cleanſing faculty it move the guts to excretion. And therefore Sugar of Roſes is thought better, which is conceived to be ſomewhat binding. Here you may have examples of ſuch Glyſters. R. *Decoctionis Capi perfectè cocti* ℔. j. ß. *ſaccharı albi,* ℥ ß. *miſce, fiat Clyſter.* R. *Decocti Pulli & Gallinæ,* ℔. ß. *vini opt.* ℥iv. *fiat Clyſter.* R. *Decocti hordei mundati, & in cremorem redacti* ℔. ß. *lactis bovi* ℔ j. *Vitellos ovorum duos, fiat Clyſter.* We uſe theſe kind of Glyſters to ſtrengthen children, old and weak men, and bodies that are in a Conſumption. But in the uſe of theſe there are three things to be obſerved: Firſt that the feculent excrements may be taken away, either by ſtrength of nature, or by art, as by a Suppoſitory, or an emollient Glyſter, leſt the alimentary matter being mingled with them, ſhould ſo be infected and corrupted. The other is, that there be great quantity given, that ſo ſome may aſcend to the upper guts. That third is, that the ſick ſleep after the taking of it; for ſo it is more eaſily converted into nouriſhment, and the alimentary matter is better kept, for ſleep hindereth evacuations. In Glyſters of this kind we muſt beware of Salt, Hony and Oil; for the two firſt provoke excretion by their acrimony, and the laſt by his humidity doth relax and lubricate. They who think no kind of Glyſter can nouriſh or ſuſtain the body, rely upon this reaſon: That it is neceſſary whatſoever nouriſheth, ſhould have a triple commutation or concoction in the body: firſt, in the ſtomach; ſecondly, in the liver; thirdly, in all the members. But this is repugnant to reaſon and experience: to reaſon, for that a certain ſenſe of ſuch things as are defective, is implanted in all and every of the natural parts of our body. Therefore ſeeing nutrition is a repletion of that which is empty, without doubt the empty and hungry parts will draw from any place that nouriſhment that is fit and convenient for them, and in defect thereof, whatſoever they meet with, which by any familiarity may aſſwage and ſatisfie their deſire. But the alimentary Glyſters, by us deſcribed, conſiſt of things which agree very well with the nature of our bodies, and ſuch as are boiled and ordered with much art, ſo to apply the chylification to be performed in the ſtomach. Therefore they may be drawn in by the meſaraick veins of the guts; which according to *Galen*, have a certain attractive faculty. And thence they may be eaſily carried through the gate-vein, liver, and ſo over the whole body. And experience teacheth, that many ſick people, when they could take nothing by the mouth, have been ſuſtained many days by the help of theſe kind of Glyſters. What is more to be ſaid? We have ſeen thoſe who have taken a Suppoſitory by the fundament, and vomited it at the mouth; by which it alſo appeareth that ſomething may flow without danger of the ſick from the guts into the ſtomach. Nouriſhing Glyſters. Their uſe. Their Argument that deny Glyſters to nouriſh. Confuted firſt by reaſon. Secondly, by experience.

Commonly they give Glyſters any hour of the day, without any reſpect of time; but it ſhould not be done unleſs a great while after meals, otherwiſe the meat, being hindred from digeſtion, will be drawn out of the ſtomach by the Glyſter.

Glyſters are uſed to help the weaker expulſive faculty 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 imbecillity by ſickneſs cannot admit of a purging medicine, may by this means at leaſt eaſe themſelves of the trouble and burden of hurtful humors. *Galen* hath attributed to Storks the invention of Glyſters, which with their bills, having drunk Sea-water, which from ſaltneſs hath a purging quality, waſh themſelves by that part, whereby they uſe to bring away the excrements of their meats, and of the body. 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 belly, 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 hapneth otherwiſe to thoſe who lie upon their left ſide; for the Glyſter being ſo injected, is conceived to abide, and (as it were) to ſtop in the *Inteſtinum rectum*, or *Colon*, becauſe in this ſite theſe two inteſtines are oppreſſed, and as it were ſhut up with the weight of the upper guts. A little while he may lie upon his back after he hath received the Glyſter, and preſent after he may turn himſelf on either ſide. And if there be pain in any part, ſo long as he is able, may incline to that ſide; Moreover, becauſe there are many who cannot by any reaſon be perſwaded to ſhew their buttocks to him that ſhould adminiſter the Glyſter, a fooliſh ſhamefaſtneſs hindring 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 body of the Syringe, whereinto the Glyſter muſt be 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 Suppoſitory 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 ſphincther-muſcle to ſend forth thoſe excrements which are knit in the guts. Anciently it had the form of an Acorn, whence it is called to this day *Glans*. The Suppoſitories we now uſually make, have the form of a Peſſary, that is round and longiſh, in the form of a Wax-Candle. They

The differences.

are either weak, ſtronger, or ſharp; the weak are made of the ſtalks or the roots of Beets, of Lard, boiled Hony with Salt, or of Caſtle-ſope. The ſtronger of purging powders, as *Hiera*, with Salt and Hony, or the juices of ſharp herbs, or mingled with the galls of beaſts. It is commonly made

The form.

thus: as, ℞. *Mellis* ℥j. *Salis aut pulveris alterius irritantis* ʒj.

The uſe.

℞. *Mellis cocti* ℥j. *pul. Colocynthidos* ϑ ß. *Salis gemmæ* ϑj. *fiat Suppoſitorium.* We uſe Suppoſitories, when the ſick by his infirmity is unwilling, or not able to bear or away with a Glyſter, as in burning Feavers: or, when as one being injected, is ſlow and reſteth in the guts. And we uſe the ſharper Suppoſitories in ſoporiferous affects of the head, that they might provoke the dull faculty of the guts to expulſion. As alſo when the condition of the diſeaſe is ſuch, that by the uſe of Glyſters there is manifeſt hurt; as in an *Enterocele*, where the gut ſo ſwells, that over and above if it be filled by the glyſter infuſed, it would the more preſs the *Peritonæum*, ſo that ſtraight-ways by the relaxed or broken part it might eaſily be 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 Hony tied up in a cloth in the form of a Filbert; the ſtring of it may hang forth, whereby the Nodule

The form of a Nodule.

in the fundament may be drawn forth. This deſcription may be an example of Nodules: ℞. *Vitellum unius ovi, cui adde ſalis modicum, fellis vervecis, mellis an.* ʒ ß. *butyri* ʒiij. *miſce, fiant Noduli filo appenſi.*

Peſſaries.

A Peſſary is groſſer than a Suppoſitory, and is appointed for the womb, being made with Cotton-Wool or Silk ſteeped in ſome medicament, and then put into the neck of the womb.

Their uſe.

A Peſſary is uſed either to ulcers of the neck of the womb, or for the procuring or ſtopping of the *Menſtrua*, or againſt ſordid and hurtful humors of the womb, cauſing hyſterical paſſions, and therefore to be waſted away and evacuated. Therefore in the compoſition of Peſſaries are uſed gums, juices, ſeeds of herbs, roots, and many other things, according to the advice 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 being tied with a ſtring, which muſt hang forth to pluck it out withall when occaſion ſerves. This following may be an example of their deſcription. ℞. *myrrh. aloes an.* ʒj. *ſabin. ſemin. nigel. artemiſ. an.* ʒij. *radic. ellebor. nig.* ʒj. *croci,* ϑj. *cum ſucco mercurial. & mille fiat Peſſus*; let it be tied to the thigh with a thred. Or thus, ℞. *maſtich. thuris, an.* ℥iij. *alum. roſ. rub. mac. cypreſ. an.* ʒij. *ladan. hypoci, ſumach. myrtil. an.* ʒiij. *fiant peſſi cum ſucco arnogloſ. & cotoniorum.* According to this example others may be made for to mollifie, to bind, to cleanſe, to incarnate, to cicatrize and cover the ulcers of the womb: they are to be put up when the patient lieth in bed, and to be kept all night.

Peſſaries are alſo made of medicinable powders, not only mixed with ſome juice, but alſo with thoſe powders alone being put into a little bag of ſome thin matter, being ſtuffed with a little cotton, that it might be of a convenient ſtiffneſs, and this kind of Peſſaries may be uſed profitably in the falling of the mother,

An example of one mentioned by Rondoletius *in his book of inward Medicines, is as followeth.*

Againſt the ſuffocation of the Mother.

℞. *Benoini, ſtyracis, caryoph. an.* ʒj. *gal. muſchi,* gr. vi. *fiat pulvis*; this being made up with cotton, may be put up into the body.

CHAP.

CHAP XXIV.
Of Oils.

PRoperly and commonly we call oil that juice which is preſſed forth of Olives; but the word is uſed more largely, for we call every juice of a fluxible, unctuous, and aiery 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 being bruiſed, that by beating the oily juice may be preſſed forth; ſome 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 bays, 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 ſecond ſort of thoſe oils which are made by the infuſion of ſimple medicines in oil, wherein they leave their qualities: and this is done three ſeveral ways, the firſt is by boiling of roots, leaves, tops of flowers, fruits, ſeeds, gums, whole beaſts, with wine, water, or ſome other juice, with common or any other oil, until the wine, water, juice be conſumed, which you may perceive to be perfectly done, if you caſt a drop of the oil into the fire, and it maketh no noiſe but burneth. It is to be remembred that ſometimes the ſeeds or fruits are for a certain time to be macerated before they are ſet to the fire, but it muſt be boiled in a double veſſel, leſt the oil partake of the fire. The making oils by infuſion.

After this manner is made *oleum coſtinum, rutaceum, de croco, cydoniorum, myrtillorum, maſtichinum, de euphorbio, vulpinum, de ſcorpionibus*, and many others. The ſecond is by a certain time of maceration, ſome 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, being infuſed in oil, are expoſed to the Sun, that by the heat thereof the oil may change, and draw into himſelf the faculty of the flowers which are infuſed: of this kind are oil of roſes, camomil, dill, lilies, of water-lilies, violets and others, as you may ſee in *Meſue*.

The third kind is properly that of the Chymiſts, and is done by reſolution made after divers manners, and of this ſort there are divers admirable qualities of divers oleaginous juices, whether they be made by the Sun or Fire, or putrefaction, as we ſhall ſpeak in his place hereafter. The manner of oils by reſolution.

We uſe oils when we would have the virtue of the medicament to pierce deep, or the ſubſtance of the medicines mingled with the oil to be ſoft and gentle. Moreover when we prepare oils that ſhould be of a cooling quality the common oil of the unripe Olive is to be uſed: of that ſhould the oil of roſes be made.

Again when we would prepare oils of heating qualities, ſuch as are *Oleum Philoſophorum*, or of Tiles, ſweet and ripe oil is to be 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 than 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, than ſimple oil. The varieties of Liniments are drawn from their effects, ſome cool, others heat, ſome humect, ſome 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 oily ſubſtance or conſiſtence, as *ſtyrax liquida*, turpentine, the mucilages of fenugreek, marſh-mallows, marrow, and other like. To theſe are ſometimes added powders of roots, ſeeds, flowers, rinds, metals, but ſparingly, that the liniment may be 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. R. *Ol. amygd. amar. lilior. an.* ℥j. *axung. anat. gallin. an* ℥ß. *butyr. ſal expert.* ℥j. *mucag. ſem. alth. fænugr. extract. in aq. hyſſop. an.* ℥ß. *pulver. croci, irios, an.* ℈j. *fiat linimentum.* This may be an example of a liniment to humect and mollifie. R. *ol. amygd. dulc.* ℥ij. *axung. humân.* ℥ß. *mucag. ſemin. malv. extract. in aq. parietar.* ℥ß. *fiat linimentum*; you may add a little ſaffron. There be many others like theſe which may be made for divers affects. They are eaſily applied to every part of the body, becauſe they are not ſo liquid as oils: the reaſon is, they are more agreeable to any of the parts. If they be to enter into any crooked narrow paſſage, ſuch as the ear, they muſt be more liquid, and have more oil: if they be 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 be ſome unguents which admit not any wax to be added, as *Ægyptiacum*, and all ſuch as are uſed in gangrenes, and all ſorts of putrid ulcers; becauſe to theſe kinds of diſeaſes all fatty things, as oils, fats, roſins, and wax, are enemies. Therefore we ſubſtitute in the place of them in *Ægyptiacum*, hony and verdigreaſe; for of theſe it hath his conſiſtence, and his quality of cleanſing.

CHAP XXVI.
Of Ointments.

OIntments are of a more ſolid conſiſtence than Liniments, and are therefore of more force. Their differences are partly taken from their effects; for ſome heat, others cool, ſome dry, and ſome humect, ſome cleanſe, ſome corroborate, ſome waſte dead fleſh, and others Ointments and their differences.

cicatrize,

cicatrize, partly from the variety of colours, partly from the first inventors, as *Album Rhasis*, *Desiccativum rubrum*: partly from the number of the simple medicaments whereof they be made, as, *Tetrapharmacum*, *Triphasmacum*, or *Nutritum*: partly from that medicament which is principal in the composition; hence are they called *Unguentum de Litharg yro*, *de Minio*, *Diapompholygos*, and such like. They are compounded of herbs, roots, seeds, fruits, metals, and part of Beasts; the juices and other liquid things being consumed away by boiling, as we have said in the Chapter of compound Oils. Herbs, and the parts of them, if they be dry, must be powdred, and also metals; but being green, they are boiled and strained forth, and the juice so pressed is wasted by boiling. Gums and Rosins some are powdred, others being put to some 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 only to the consistence of the ointment, it is better to leave the quantity to the will of the Apothecary; but he may be more sparing in adding Wax to the ointments in Summer than in Winter; for the heat of Summer, drying them, addeth to the consistence: by examples propounded, these common precepts will more plainly appear.

unguentum astringens. R. *Olei ros.* ℥iv. *pil. lepor. bol. armen. terræ sigil. an.* ʒj. *bal. Gallar. an.* ʒß. *tritis terendis, & simul mixtis, addita cera quod sufficit, fiat unguentum.* Here we must observe, that there be three ways of making ointments: The first is of those which are made only by stirring or grinding in the Mortar without any fire, and so is made *Unguentum nutritum*. The second is, when we dissolve Wax in Oil, Fat, or some such substance with fire: and being all dissolved, we mingle the powders according to the proportion we noted before. After which manner are made *Unguentum Aureum*, *Basilicon*, *Diapompholygos*, *Deficcativum rubrum*, *Exulatum*. The third sort is, when we bruise herbs with a pestel, and mingle them with Axungia, 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. *Lithar. auri triti & loti* ℔ß. *olei ros.* ℔. j. *aceti ros.* ℥iv. *fiat Unguentum.* First, we put the Litharge into the Mortar, pouring in a little Oil, and working it with a Pestel, that it may grow thick, then with the Oil we put a little Vinegar, continually working, until they mingle into one body, now and then between whiles adding sometimes a little Oil, sometimes a little Vinegar, until the whole be brought to the consistence of an ointment. If of an ointment of this kind thou wouldst make a black plaister, by degrees consume all the Vinegar, so shall the plaister shine and grow black.

unguentum aureum. R. *Ceræ citr.* ℥vj. *olei boni* ℔ij. *terebenth.* ℥ij. *resin. & colophon. an.* ℥j ß. *olib. mastich. an.* ʒj. *croci,* ʒj. *fiat Unguentum.* First, dissolve the Wax with a good part of Oil, then add the Rosin and Colophony broken small. These being dissolved, take the composition from the fire, and then add the Turpentine, when the whole is somewhat cooled; add the *Olibanum* and Mastick being finely powdred, then the Saffron, which shall be macerated in the rest of the Oil.

Ung. Tetrapharmacum, seu Basilicon. Tetrapharmacon is so called, because it is made of four simple medicines, Wax, Rosin, Pitch, Tallow, of each a like quantity, and so equally mixed.

R. *Resin. picis nigr. adip. vituli, & ceræ an.* ℥ij. ß. *Olei veteris olivarum maturarum,* ℔j. ß. or if you would have it harder, ß. j. that ointment is also called *Basilicon*, the Wax being cut small and dissolved in Oil, then add the rest of the things, which being dissolved, thou shalt have the desired ointment.

Ung. Diapompholygos. R. *Olei ros.* ℥ix. *cer. alb.* ℥iij. *succi solani hortensis,* ℥iv. *Cerus. lot.* ʒj. *Pompholygos, plumbi usti & loti, olib. puri, an.* ʒß. *fiat unguentum.* Dissolve 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, pouring on the juice by degrees, at least so much of it as will incorporate.

Ung. deficcativum rubrum. R. *Lap. calam. ter sig. an.* ℥ij. *Litharg. auri cerus. an.* ℥j ß. *Camphor.* ʒß. *ceræ,* ℥ij ß. *Olei rosat. viol. an.* ℥iij. *fiat Unguentum.* Dissolve the Wax in the Oil, then set it to cool, and work in the powders with a spatter, and at last add the Camphire dissolved in a little Oil of Roses, or Rosewater.

Ung. Exulatum. R. *Rad. enul. campan. coct. cum aceto & contus. ut decet* ℔ß. *Axung. porci, olei commun. an.* ℥i ß. *argen. vivi extincti, & terebenth. lot. an.* ʒj. *sal. commun. pulverisati,* ʒij. incorporate them according to art. The boiled roots must be drawn through a Sieve, which being boiled by a gentle fire with the *Axungia*, must be continually stirred, then put to the Salt with Oil and Wax: when you set it from the fire to cool, then add the Quicksilver, being killed with a little *Axungia* and Turpentine.

Ung. Album Rhasis. De Althæa. R. *Olei rosat.* ℥ix. *cerus. alb.* ℥iij. *cer. alb.* ℥ij. make it thus: let the Cerus be finely powdred, and put into the Oil and Wax whilst it is hot, and so work the whole together until they shall be brought into a body. R. *Rad. Altb.* ℔. j. *semi. lini, fœnugr. an.* ℔ß. *Scyllæ* ℥iij. *Olei com.* ℔. ij. *cer.* ℔. ß. *terebinth. gum. heder. galb. an.* ʒj. *colophon. & resin.* ℥iij. The roots and seeds being bruised, are infused for three days in five pints of water; boil them until three ounces be consumed, and then draw forth the Mucilage, and boil it with the Oil, then add Wax cut small: these being taken from the fire, the *Galbanum* being dissolved with Vinegar, and mingled with the Turpentine, must be added together with the Gum *Hederæ*, Colophony, and Rosin.

Ung. Populeum. R. *Ocul. populi alb.* ℔. j. ß. *fol. papaveris nigr. Mandrag. hyoscyami, lactucæ, sempervivi parvi & magni, violæ nigræ solani, umbilici Veneris, seu cymbalar. hordeac. an.* ʒ ß. (*Cordæi, Fernelius, & Nicolaus singulorum* ℥iij. *præscribunt*) *Adipis suilli recentis salis expertis,* ℔ij. *vini boni,* ℔ j. *fiat Unguentum.* The popular buds and Violet leaves must be bruised and macerated in the *Axungia* for the space of two months, that is until the rest of the herbs be ready; for they cannot be gathered before the Summer time, but the Poplar buds and Violets may be had in March. They must be bruised and mingled very well, and set in a warm place for eight days; then add one pint of strong Vinegar, and boil them till it be consumed, which may be perceived by casting a little of it into the fire, then strain it forth, and put up the ointment.

Ung. Apostolorum. R. *Tereb. cer. alb. res. an.* ℥xiv. *Opop. star. seu virid. æris (nam hic flos æris non proprie accipiter pro gran. quæ scintill. instar ab ære exiliunt dum a fabr. ferrar. aqua tingitur: sed pro viridi æris usurpatur, cujus contra maligna ulcera nostræ sunt vires, contra quæ omnino id Unguent. est comparat.) an.* ʒij. *ammon.* ℥xiv. *argil. lon. store. mastic. an.* ʒvj. *myr. & galb. an.* ʒiij. *bdel.* ʒvj. *Lith.* ℥ix. *ol.* ℔ij. *fiat Ung.* The Litharge is to be mingled with two ounces of Oil for the space of five hours, and with a gentle fire to be boiled until it come to the consistence

ſiſtence of Honey, and be always ſtirring leſt it burn: being taken from the fire and warm, the Wax and the Roſin being diſſolved, with the reſt of the Oil, muſt be added. Then put to it, when it is cooling, the Gums diſſolved in Vinegar, boiled and incorporated with the Turpentine. Then the *Ariſtolochia*, Myrrh, and Frankincenſe are to be mingled, and laſt of all the Verdigreaſe, being in fine Powder, and ſprinkled in: and ſo the Unguent is made. ℞ *Cortic. mediani, caſtan. cortic. median.* *Comitiſſa, quere. cortic. median. gland. myrtil. equeſ cortic. fabar. acinor. uvar. ſorbor. ſiccor. immature. meſpiller. immaturor. rad. chelidon. folior. prunor. ſylveſt. an.* ℥ j. ß. *aquæ plantag.* ℔ viij. *cer. nov.* ℥ viij. ß. *olei myrtillor.* ℔ ij. ſ. Then theſe things which follow being finely powdered, are to be ſprinkled in. ℞ *Pulveris corticis mediani caſtan. corticis mediani gland. cortic. median. arb. gland. id eſt, quere. gallar. an.* ℥ j. *cineris off. cruris bovis, myrtill. acinor. uvar. ſorbor. ſiccor. an.* ℥ ſ. *Trochiſcorum de carabe,* ʒ ij. *fiat Unguentum.* First make a decoction *Corticis mediani arboris quercus, 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 being all ſpent, and the Wax and Oil being melted, then inſperge the Powders, *Cruris bovis, aſſum, corticis med. cortic. quere. med. 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 abſynth. maſtich. de ſtic. roſat. an.* ℥ ß. *pulver. abſynth. roſ. major. menth. an.* ℨ j. *caryoph. cinam. maſtich. galang. an.* ℨ j. Powder thoſe things which are to be powdered, and with a ſufficient quantity of Wax make a ſoft Ointment, wherewith let the ſtomach be anointed one hour before Meals continually. ℞ *Cer. alb.* ℔ ij. *ceruſ. litharg. auri, an.* ℔ j. *myrrh. medul. cervi, an.* ℥ ij. *thuris,* ℥ j. *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*, being finely powdered, muſt be caſt in by little and little, and the Ointment may be put up for uſe. The chops of the fundament, and emollient Peſſaries are likewiſe made of it, and it is very good againſt the bitings of mad Dogs, and the punctures of nerves and tendons, keeping wounds ſo that they do not agglutinate. ℞ *Picis pinguis,* ℔ j. *opopanacis in aceto forti, oleo liliorum, & veteri porci axungia colli,* ʒ iij. *fiat Unguentum. Oleum ex ſinapi* is good againſt thoſe bitings of mad Beaſts and punctized nerves; for it doth open wounds when they are cicatrized. Ointments are uſed to overcome the contumacy of a ſtubborn evil by their firm and cloſe ſticking to, eſpecially if there ſhall need no Medicin to go further into the body.

Comitiſſa.

Ung. pro flamma.

Ung. ad morſus rabioſos, ex li. 1. Gal. de comp. ſec. genera.

3. De comp. med. ſec. gen.

CHAP. XXVII.

Of Cerats and Emplaſters.

What a Cerat is.

The differences.

SUch affinity 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 than an Ointment, and ſofter than 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 ſome from the parts by which they are called, as *Ceratum ſtomachicum*: ſome 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, being 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.

Cerats which are made with Roſins, Gums, and Metals, do rather deſerve the names of Emplaſters than Cerats. And therefore *Ceratum ad Hernias* we commonly call *Emplaſtrum contra Ruptu-ram*. If that pain or inflammation do grieve any part, we make Cerats of Plaſter diſſolved with Oil, leſt that the more hard and heavy conſiſtence of the Emplaſter ſhould be troubleſom to the part, and hinder perſpiration: and therefore laying aſide the compoſition of Cerats, let us ſpeak of Emplaſters.

Emplaſters.

An Emplaſter is a compoſition which is made up of all kind of Medicins, eſpecially of fat and dry things, agreeing in one groſs, viſcous, ſolid, and hard body, ſticking to the fingers. The differences of Emplaſters are taken from thoſe things, which the variety of Ointments are taken from. Of thoſe things which go into the compoſition of an Emplaſter, ſome are onely uſed for their quality and faculty, 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 be uſeful for both, as Gums, Metals, parts of Beaſts, Roſin, Turpentine to digeſt, to cleanſe and dry. Of Emplaſters, ſome are made by boiling, ſome are brought into a form without boiling; thoſe which be made without fire, do ſuddenly dry, nor are they viſcous: they are made with Meal and Powder, with ſome juice, or with ſome humid matter mingled with them. But Plaſters of this kind may rather be called hard Ointments or Cataplaſms: for Plaſters properly ſo called are boiled, ſome of them longer, ſome ſhorter, according to the nature of thoſe things which make up the compoſition of the Emplaſter: Therefore it will be worth our labour to know what Emplaſters do aſk more, or which leſs boiling. For Roots, Woods, Leaves, Stalks, Flowers, Seed, being dried, and brought into Powder, are to be added laſt, when the Plaſter is boiled as it were, and taken from the fire, leſt the virtue of theſe things be loſt. But if green things are to be uſed in a compoſition, they are to be boiled in ſome liquor, and being preſſed forth, that which is ſtrained to be mingled with the reſt of the compoſition; or if there be juice to be uſed, it is to be bruiſed and preſſed forth, which is ſo to be boiled with the other things, that nothing for the quality is to remain with the mixture, as we uſe to do in *Empl. de Jovis, ſeu Betonica, & Gratia Dei*. The ſame is to be done

with

with Mucilages, but that by their clamminess they do more resist the fire. But there doth much of Oil and Honey remain in their Plasters when they are made. Those juices which are hardned by concretion, as *Aloes*, *Hypocistis*, *Aesecia*, when they are used in the composition of a Plaster, and be yet new, they must be macerated and dissolved in some proper liquor, and then they are to be boiled to the consumption of that liquor. Gums, as *Opopanax*, *Galbanum*, *Sagapenum*, *Ammoniacum*, must be 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 quantity of Gums and Pitch, it is necessary that first they be dissolved, strained, and boiled, because of the sticks and sordid matter which are mingled with them. You must have respect also to the liquor you use to dissolve them in; for Vinegar of the best Wine doth more powerfully penetrate, than that which is of weak and bad Wine.

Other Gums, which are drier, are to be powdered, and are to be mingled with Plasters last of all. Metals, as *Æs ustum*, *Chalcitis*, *Magnes*, *Bolus Armenius*, *Sulphur*, *Auripigmentum*, and others, which may be brought to Powder, must be mingled last, unless advice be given by long boiling to dull the fierce qualities of them. The like consideration is to be had of Rosin, Pitch, and Turpentine, which must be put in after the Wax, and may not be boiled but very gently; but the Fats are mingled whilest the other things are boiling. The Litharge is to be boiled with the Oil to a just consistence, if we would have the Plaster dry without biting. Cerus may endure as long boiling, but then the Plaster shall not be white, neither will the Litharge of silver make a Plaster with so good a colour as Litharge of gold. Moreover, this order must be observed in boiling up of Plasters: the Litharge must be boiled to its consistence; Juices or Mucilages are to be boiled away, then add the Fats, then the dry Rosin, Wax, Gums, Turpentine, and after them the powders: You shall know the Plaster is boiled enough by its consistence, gross, hard, glutinous, and sticking to the fingers, being cooled in the air, water, or upon a stone. Also you shall know it by its exact mixtion, if that all the things become one mass hard to be broken.

Signs of a Plaster perfectly boiled.

The quantity of things which are to be put into a Plaster can hardly be described, but an artificial conjecture may be given, by considering the medicaments which make the Plaster stiff, and of a consistence, and the just hardness and softness they make being boiled. Wax is not put into such Plasters wherein is *Labdanum*, for that is in stead of Wax. For if there shall be in the composition of a Plaster some emplastick Medicaments, the Wax shall be the less; contrariwise, if they shall be almost all liquid things, the Wax shall be increased so much as shall be necessary for the consistence of the Plaster. The quantity of the Wax also must be altered according to the time, or the air; therefore it is fit to leave this to the art and judgment of the Apothecary. Emplasters are sometimes made of Ointments by the addition of Wax, or dry Rosin, or some other hard or solid matter. Some would that a handful of Medicaments powdered, should be mingled with one ounce, or an ounce and half of Oil, or some such liquor, but for this thing, nothing can certainly be determined: onely in Plasters described by the Ancients there must be great care had, wherein he must be very well versed, who will not err in the describing the dose of them; and therefore we will here give you the more common forms of Plasters.

The quantity of things to be put into Plasters.

Empl. de Vigo with Mercury. ℞ *Ol. chamæm. anethi. de ficis, liliacei, an.* ℥ ij. *ol. de croco,* ʒ j. *pingued. porci,* ℔ j. *pingued. vitul.* ℔ ß. *euphorb.* ʒ v. *thuris* ʒ x. *ol. lauri,* ʒ j. ß. *ranæ viv.* nu. vj. *pingued. viper. vel ejus loco human.* ℥ ij. ß. *lumbricor. totor. in vino* ℥ iij. ß. *succi ebuli, enul. ana* ℥ ij. *schœnanthi, stœchados, matricar. an.* m. ij. *vini odoriferi,* ℔ ij. *litharg. auri* ℔ j. *terebinth. claræ* ℥ ij. *styracis liquid.* ℥ j. ß. *argenti vivi extincti*, so much as the present occasion shall require, and the sick shall be able to bear, and make up the Plaster. To one pound of the Plaster they do commonly add four ounces of Quick-silver, yet for the most part they do increase the dose, as they desire the Plaster should be stronger: the Worms must be washed with fair Water, and then with a little Wine to cleanse them from their earthy filth, of which they are full, and so the Frogs are to be washed and macerated in Wine, and so boiled together to the consumption of a third part; then the Squinanth must be bruised, the Feverfew and the Stœchas cut small, and they being added, to be boiled to the consumption of one pint, and being boiled sufficiently, the decoction being cooled shall be strained and kept; and the Litharge is to be infused for twelve hours in the Oil of Chamomile, Dill, Lillies, Saffron, and the axungies above spoken of. Then boil them all with a gentle fire, by and by taking 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 be consumed, and then by degrees add to the rest of the decoction: the Oil of Spike shall be reserved unto the last, which may give the Plaster a good smell. Then are added the juices of Walwort and Enula, which must be boiled until they be wasted away. Afterwards it being taken from the fire, to the composition is added the Frankincense and Euphorbium, and white Wax as much as shall suffice. When the whole mass shall cool, then at last is mingled the Quick-silver extinct, Turpentine, Oil of bitter Almonds, Bays, Spike, of Line, Styrax and Axungia, being continually stirred, and it shall be made up upon a stone into rolls. Unless the Quick-silver be well extinguished, it will run all into one place, and unless you tarry until the composition cool, it will vapour away in fume.

Ceratum ασσυρι ex Philagrio. ℞ *Croci* ʒ ij. *bdellii, masticb. ammon. styrac. liquid. an.* ℥ ß. *ceræ alb.* ℔ ß. *tereb.* ʒ vj. *medul. cruris vaccæ, adipis anserini, an.* ℥ j. *ασσυρι, vel si desit, axung. gallin.* ʒ ix. *olei nard. quantum satis ad magdaleones formandos, expressionis scillæ,* ʒ j. ß. *olibani, sevi vitul.* ℥ j. The *ασσυρι, sepum, adeps, medulla, cera*, are to be dissolved together; when they cool, add the *Ammoniacum* dissolved in the decoction of Fœnugreek and Chamomile, half an ounce, and so much juice of Squils, then put to the Styrax and Turpentine, stirring them continually; then add the *Bdellium*, *Olibanum*, Mastick, Aloes, brought into fine Powder, and when they are perfectly incorporated into a mass, let them be made up with *Oleum nardinum* into rolls.

De gratia Dei. ℞ *Terebinth.* ℔ ß. *ασσυρι.* ℔ j. *cer. alb.* ℥ iv. *mastich.* ℥ j. *fol. verben. beton. pimpinel. an.* m. j. The Herbs being green, the

the tops are to be 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 being diſſolved by the fire; the liquor being conſumed put to the Roſin, when it ſhall cool add the Maſtick powdered, working it with your hands, by which it may be incorporated with the reſt of the things.

℞ *Succi beton. plantag. apii, an.* ℔ j. *ceræ, picis, reſin. tereb. an.* ℔ ß. *fiat. empl.* The Juices are to be mingled with the Wax being diſſolved, and boiling them until three parts be conſumed, add the Roſin and Pitch, which being diſſolved and hot, muſt be ſtrained, and then add the Turpentine, and make up the Plaſter. *De Jaxa, ſeu de Betonica.*

℞ *Croci, picis com.* (or rather *picis naval.* becauſe this emplaſter is uſed to diſcuſs and draw forth the matter which cauſeth the pain of the joints) *coloph. ceræ, an.* ℥ ij. *tereb. galb. ammon. thuris, myrrhæ, maſtich. an.* ℥ v. ß. The *cera, pix,* and *colophonia* are by little and little to be 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 Oxycroceum.*

℞ *Ol. com.* ℔ ij. *ceruſ. ſubtiliſ.* ℔ j. boil them together with a gentle fire, ſtirring them continually until they come to the body of an emplaſter: if you would have the Plaſter whiter, take but ℥ ix. of the Oil. *De ceruſa.*

℞ *Litharg. triti, acet. fortiſ. an.* ℔ ß. *ol. antiq.* ℔ j. *fiat emplaſtrum:* let the Oil be mingled with the Litharge for the ſpace of twelve hours, then boil them until they come to a good conſiſtence, putting in the Vinegar by little and little; but you ſhall not take it from the fire until the Vinegar be quite waſted away. *Tripharmacum, ſeu nigrum.*

℞ *Ol. vet.* ℔ iij. *axung. vet. ſine ſale,* ℔ ij. *litharg. trit.* ℔ iij. *vitriol.* ℥ iv. let the Oil be mingled with the Litharge for the ſpace of twelve 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 being ſufficiently boiled, take it from the fire, and add the Vitriol in fine powder. *Diapalmæ, ſeu diacalcitheos.*

℞ *Picis naval. aloes, an.* ℥ iij. *litharg. ceræ, coloph. galban. ammoniac. an.* ℥ ij. *viſci querni,* ℨ vj. *gypſi uſt. utriuſque ariſtoloch. an.* ℥ iv. *myrrhæ, thuris, an.* ℥ vj. *tereb.* ℥ ij. *pulveris verminum terreſtrium, gallar. ram. utriuſque conſolid. bol. arm. an.* ℨ iv. *ſang. humani,* ℔ j. *fiat. emplaſt.* If you would have it of a very good conſiſtence, you may add of the Oil of Myrtils or Maſtick, ℔ ß. you ſhall make it thus: Take the skin of a Ram cut in pieces, and boil it in an hundred pints of Water and Vinegar until it come to a glue or ſtiff gelly, in which you ſhall diſſolve the *viſc. querc.* 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 Vinegar, being mingled with the terebinth, may be added. Then add the Litharge, *gypſum, bol. ariſtoloch. conſolida, vermes, & ſang. human.* At laſt the Myrrh, *thus, colophon,* and *aloe,* ſtirring them continually; and that they may be the better mingled, work the Plaſter with a hot Peſtle in a Mortar. *Contra Raptio-nem.*

℞ *Mucag. ſem. lini, rad. altb. fœnugr. median. corticis ulmi, an.* ℥ iv. *olei liliacei, cham. aneth. an.* ℥ j. ß. *ammon. opopanac. ſagap. an.* ℥ ß. *croci,* ʒ ij. *ceræ nov.* ℔ ß. *tereb.* ℨ ß. *fiat. empl.* *Fernelius* hath ℥ xx. of Wax: the Wax being cut ſmall muſt be mingled with the Oils and the Mucilages, ſtirring them continually with a wooden Spatter till the liquor be conſumed. Then the gums diſſolved and mingled with the terebinthina muſt be added, and laſt of all the Saffron finely powdered. *De Mucagi-bus.*

℞ *Ol. roſ. myrtil. ung. populeon, an.* ℥ iv. *pinguedinis gallin.* ℥ ij. *ſebi arietis caſtrati, ſepi vaccini, an.* ℥ vj. *pingued. porci,* ʒ x. *litharg. auri, argenti, an.* ℥ iij. *ceruſ.* ℥ iv. *minii,* ʒ iij. *tereb.* ℥ iv. *ceræ q. ſ. fiat emplaſtrum vel cerotum molle.* The *lithargyros, ceruſa,* and *minium,* are to be brought into fine powder, ſeverally being ſprinkled with a little Roſe water, leſt the fineſt of it ſhould fly away; theſe being mingled with the Oil of Roſes and Myrtles, with a gentle fire may be boiled until they come to the conſiſtence of Honey; then add the *axungiaes,* and boil them till the whole grow black, after add the *ſebum,* and that being diſſolved, take it from the fire, and then add the *unguentum populeon,* and ſome Wax if there be need; and ſo bring it to the form of a Plaſter. *De minio.*

℞ *Litharg. puri pul.* ℥ xij. *ol. irin. chamæm. aneth. an.* ℥ viij. *mucag. ſem. lini, fœnug. rad. altb. ficuum pingu. uvar. paſſar. ſucci ireos, ſcillæ, aſpi, ichthyocollæ, an.* ʒ xij. ß. *tereb.* ℥ iij. *reſ. pini, ceræ flavæ, an.* ℥ ij. *fiat emplaſtrum:* The Litharge is to be mingled with the Oil before it be ſet to the fire, then by a gentle fire it is to be boiled to a juſt conſiſtence; after the mucilage by degrees muſt be put in, which being conſumed the juices muſt be added and the ichthyocolla, and they being waſted too, then put to the Wax and Roſin, then taking the whole from the fire, add the *aſpim* and *terebinthina.* *Diachylon magnum.*

We uſe Plaſters when we would have the remedy ſtick longer and firmer to the part, and would not have the ſtrength of the Medicament to flie away or exhale too ſuddenly. The uſe of Plaſters.

CHAP. XXVIII.

Of Cataplaſms and Pultiſſes.

CAtaplaſms are not much unlike to Emplaſters leſs properly ſo called, for they may be ſpred upon linnen cloths and ſtoups like them, and ſo applied to the grieved parts. They are compoſed of Roots, Leaves, Fruits, Flowers, Seeds, Herbs, Juices, Oils, Fats, Marrows, Meals, Roſins. Of theſe ſome muſt be boiled, others crude. The boiled are made of Herbs boiled tender, and ſo drawn through an hair Searſe, adding Oils and Axungiaes thereto. The crude are made of Herbs beaten, or their juices mixed with Oil and Flower, or other Powders appropriate to the part or diſeaſe, as the Phyſician ſhall think fit. The quantity of Medicins entering theſe compoſitions can ſcarce be defined, for that they muſt be varied as we would have the compoſition of a ſofter or harder body. Verily they ought to be more groſs and denſe when as we deſire to ripen any thing, but more ſoft and liquid when we endeavour to diſcuſs. We uſe Cataplaſms to aſſwage pain, digeſt, diſcuſs and reſolve unnatural tumors and flatulencies. They ought to be The matter of Cataplaſms. Their uſe.

moderately hot and of subtle parts, so to attract and draw forth; yet their use is suspected, the body being not yet purged, for thus they draw down more matter into the affected part. Neither must we use these when as the matter that is to be discussed is more gross and earthy, for thus the subtler parts will be onely discussed, and the gross remain impact in the part, unless your Cataplasm be made of an equal mixture of things, not onely discussing, but also emollient, as it is largely handled by Galen.

Lib. 2. ad glauc. ubi de scirrho.

An Anodyne Cataplasm.

A ripening Cataplasm.

A discussing Cataplasm.

How Pultises differ from Cataplasms.

This shall be largely illustrated by examples. As, ℞ *Medul. panis,* ℔ ß. *decoquantur in lacte pingui. adde olei chamæm.* ℥ ß. *axung. galin.* ℥ j. *fiat cataplasma.* Or, ℞ *Rad. althæ.* ℥ iij. *fol. malv. senecionis, an.* m. j. *sem. lini, fœnug. an.* ʒ ij. *ficus, ping.* nu. vj. *decoquantur in aqua, & per setaceum transmittantur, addendo olei lilior.* ℥ j. *far. hord.* ℥ ij. *axung. porcin.* ℥ j. ß. *fiat cataplasma.* Or, ℞ *Far. fab. & orob. an.* ℥ ij. *pulv. chamæm. & melil. an.* ʒ iij. *ol. irin. & amygd. amar. an.* ℥ j. *succi rut.* ℥ ß. *fiat cataplasma.* Pultises differ not from Cataplasms, but that they usually consist of Meals boiled in Oil, Water, Honey, or Axungia. Pultises for the ripening of tumors are made of the Flour of Barley, Wheat and Milk, especially in the affects of the entrails; or else to drie and bind, of the Meal of Rice, Lentils, or *Orobus*, with Vinegar; or to cleanse, and they are made of Honey, the Flour of Beans and Lupines, adding thereto some old Oil, or any other Oil of hot quality, and so making a discussing Pultise. Also Anodyne Pultises may be made with Milk; as thus for example, ℞ *Farin. triticeæ,* ℥ ij. *micæ panis purissimi,* ℥ iij. *decoquantur in lacte, & fiat pulticula.* ℞ *Farin. hordei & fab. an.* ℥ ij. *far. orob.* ℥ iij. *decoquantur in hydromelite, addendo mellis* quart. j. *olei amyg. amar.* ℥ ij. *fiat pulticula.* We use Pultises for the same purpose as we do Cataplasmes, to the affects both of the internal and external parts. We sometimes use them for the killing of Worms, and such are made of the Meal of Lupines boiled in Vinegar, with an Oxes 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 Medicins having these faculties. A Fomentation commonly useth to be moist, being 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 Lillies. The Seeds are of Mallows, Marsh-mallows, Parsley, Smallage, Line, Fenugreek. Flowers are of Camomil, Melilot, Figs, Raisins, and the like: all which are to be boiled in Wine, Water, or Lye, to the consumption of the third part, or the half: as,

℞ *Rad. althæ. & lil. an.* ℥ ij. *sem lini, fœnug. cumin. an.* ʒ iij. *flo. cham. melil. & aneth. an.* p. j. *summit. orig.* m. ß. *bulliant in æquis partibus aquæ & vini, aut in duabus partibus aquæ, & una vini, aut in Lixivio cineris sarmentorum, ad tertiæ partis consumptionem, fiat fotus.* In imitation hereof you may easily describe other Fomentations, as occasion and necessity shall require.

Their use.

We use Fomentations before we apply Cataplasms, Ointments, or Plasters to the part, that so we may open the breathing places or pores of the skin, relax the parts, attenuate the humour, that thus the way may be the more open to the following Medicins. The body being first purged, Fomentations may be used to what parts you please. They may be applied with a female Spunge, for it is gentler and softer than the male: with Felt, woollen Cloths, or the like dipped in the warm decoction wrung out, and often renewed; otherwise you may fill a Swines bladder half full (especially in pains of the sides) of the decoction, or else a stone-bottle, so to keep hot the longer; yet so, that the bottle be 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*.

2. *De victu in acutis.*

CHAP. XXX.

Of Embrocations.

What an Embrocation is.

AN *Embroche* or Embrocation, is a watering, when as from an high we (as it were) shower down some moisture upon any part. This kind of remedy is chiefly used in the parts of the head, and it is used to the coronal future, for that the skull, is more thin in that part, so that by the *spiracula* or breathing places of this future, more open than those of the other futures, the force of the Medicin may more easily penetrate unto the *Meninges*, or membrans of the brain. The matter of Embrocations is Roots, Leaves, 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 be made of Lye or Brine against the cold and humid affects of the brain. Sometimes of Oil and Vinegar, otherwhiles of Oil onely. ℞ *Fol. plantag. & solan. an.* m. j. *sem. portul. & cucurb. an.* ʒ ij. *myrtil.* ʒ j. *flor. nymph. & ros. an.* p. ß. *fiat decoct. ad* ℔ j. *cum aceti* ℥ ij. *si alte sub cranium sit ex qua irrigetur pars inflammata.*

In affects of the brain, when we would repercuss, we often and with good success use Oil of Roses with a fourth part of Vinegar.

Their use.

We use Embrocations, that together with the air drawn into the body by the *Diastole* of the Arteries, the subtler part of the humour may penetrate, and so cool the inflamed part; for the chief use of Embrocations is in hot affects. Also we use Embrocations, when as for fear of an hæmorrhagy, or the flying asunder of a broken or dislocated member, we dare not loose the bandages wherein the member is bound. For then we drop down some decoction or oil from high upon the bandages, that by these the force of the medicin may enter into the affected member.

CHAP.

CHAP. XXXI.

Of Epithemes.

Epithema, or an Epitheme, is a composition used in the diseases of the parts of the lower and middle belly, 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 be added, as in swooning by the clotting of bloud, by the corruption of the seed, by drinking some cold poison; the contrary is to be done in a fainting, by dissipation of the spirits by severish heats, also Vinegar may be added. The matter of the Medicins proper to the entrails is formerly described, yet we commonly use the *species* of Electuaries, as the *species electl. triasantali*, the Liver being affected, and Diamargariton in affects of the heart. The proportion of the Juices or Liquors to the Powders uses to be this, to every pint of them ℥ j. or ʒ j. ℈. of these, of Wine or else of Vinegar ʒ j. You may gather this by the following example: What an Epitheme is. In the fifth Chapter.

℞ *Aqu. ros. bugl. borag. an.* ℥ iij. *succi scabios.* ℥ ij. *pul. electl. diamarg. frigid.* ʒ ij. *cort. citri sicci* ʒ j. *coral. ros. chor. an.* ʒ ℈. *sem. citri & cardi ben. an.* ʒ ij. ℈. *croci & moschi, an. gr. v. addendo vini albi* ʒ ij. *fiat Epithema pro corde.* A cordial Epitheme.

Epithemes are profitably applied in hectick and burning Fevers to the Liver, heart, and chest, if so be that they be rather applied to the region of the lungs than of the heart; for the heat of the lungs being by this means tempered, the drawn in air becomes less hot in the pestilent and drying Fevers. They are prepared of humecting, refrigerating, and cordial things, so to temper the heat, and recreate the vital faculty. Sometimes also we use Epithemes to strengthen the heart, and drive therehence venenate exhalations, lifted or raised up from any part which is gangrenate or sphacelate. Some Cotton, or the like, steeped or moistned with such liquors and powders warmed, is now and then to be applied to the affected entrail: this kind of remedy, as also all other topick and particular Medicins, ought not to be used, unless you have first premised general things. Their use.

CHAP. XXXII.

Of Potential Cauteries.

That kind of Pyrotick which is termed a Potential Cautery, burns, and causeth an eschar. The use of these kinds of Cauteries is to make evacuation, derivation, revulsion, or attraction of the humours by those parts whereto they are applied. Wherefore they are often and with good success used in the punctures and bites of venomous Beasts, in a venomous, as also in a pestilent Bubo and Carbuncle, unless the inflammation be great: for the fire doth not onely open the part, but also retunds the force of the poison, calls forth, and plentifully evacuates the conjunct matter. Also they are good in phlegmatick and contumacious tumours; for by their heat they take away the force and endeavours of our weak heat. Also they are profitably applied to stanch bleeding, or eat and 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 use of potential Cauteries.

The materials of these Cauteries are Oak-ashes, Pot-ashes, the ashes of Tartar, of Tithymals or Spurges, the Fig-tree, the stalks of Colewort, 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 its heat is caustick and escharotick, like to an hot iron and burning coal: Therefore it violently looses the continuity by eating into the skin, together with the flesh thereunder. I have thought good here to give you divers forms of them. The matter of them.

Take of unquencht Lime extinguished in a bowl of Barbers Lye three pounds: When the Lye is setled let it be 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 be beaten into a gross powder, then must they be boiled over the fire, and after the boiling let them remain in the Lye for four and twenty hours space, being often stirred about, and then strained through a thick and double linnen cloth, lest any of the earthy 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 brazen Basin, such as Barbers use, and so set it upon the fire, and as soon as it boils, they keep it with continual stirring, lest the Salt should adhere to the Basin; the *Capitellum* being half boiled away, they put in two ounces of powdered vitriol, so to hasten the falling of the eschar, and so they keep the Basin over the fire till all the liquor be almost wasted away. Then they cut into pieces the Salt or that earthy matter which remains after the boiling away of the *Capitellum*, and with a Knife or hot iron Spatula, form them into Cauteries of such figure and magnitude as they think fitting, and so they lay them up, or keep them for use in a Vial or Glass closely stopped, that the air get not in: Or, The forms of them.

Take a bundle or sufficient quantity of Bean-stalks or husks of Colewort 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 days space, being stirred ever now and then; to this add two pounds of unquenched Lime, of *Axungia vitri* half a pound, of calcined Tartar two pounds, of *Sal niter* four ounces, infuse all these, being made into powder, in the foresaid Lye for two or three days space, often stirring it, then strain the *Capitellum* or liquor through a thick cloth until it become clear. Put it into a Basin, and set it over the fire, and when as the moisture is almost

wholly spent, let two or three ounces of Vitriol be added; when the moisture is sufficiently evaporated, make cauteries of that which remains, after the formerly mentioned manner.

Take of the ashes of sound, knotty old Oak as much as you please, make thereof a Lye; pour this Lye again upon other fresh ashes of the same Wood: let this be done three or four times, then quench some Lime in this Lye, and of these two make a *Capitellum*, whereof you may make most approved Cauteries: For such ashes are hot in the fourth degree; and in like sort the stones, whereof the Lime by burning becomes fiery and hot to the fourth degree: Verily I have made Cauteries of Oak-ashes onely, which have wrought quickly and powerfully. The *Capitellum* or Lye 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 unquencht Lime, Argol, of the ashes of Oak-wood, being all well burnt, of each two pounds. Let them for two days space be infused into a vessel full of Lye made of the ashes of Oak-wood, and be often stirred up and down. Let this Lye then be put into another vessel, having many holes in the bottom thereof, covered with firums or straw-pipes, that the *Capitellum* flowing thorow these strait passages may become more clear. Let it be put twice or thrice upon the ashes, that so it may the better extract the heat and caustick quality of the ashes. Then putting it into a Barbers Basin, set it over the fire, and when it shall begin to grow thick the fire must be increased, and Cauteries made of this concreting matter.

The faculty of the silken Cautery.

The following Cauteries are the best that ever I made trial of, as those that applied to the arm in the bigness of a Pease, in the space of half an hour without pain, especially if the part of it self be painless and free from inflammation, eat into the skin and flesh even to the bone, and make an ulcer of the bigness of ones fingers end, and they leave an Eschar so moist and humid, that within four or five days space it will fall away of it self without any 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 because I obtained the description of them of a certain Chymist (who kept it as a great secret) for some Velvet and much entreaty.

The cause of the name.

Their description.

Their description is this:

Take of the ashes of Bean-stalks, of the ashes of Oak-wood well burnt, of each three pounds, let them be infused in a pretty quantity of River water, and be often stirred up and down, then add thereto of unquencht Lime four pounds, which being quencht, stir it now and then together for two days space, that the *Capitellum* may become 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 to it may draw more of the caustick faculties from them, then boil it in a Barbers Basin, or else an earthen one well leaded, upon a good Charcoal fire, until it become thick. But a great part of the secret or Art consists in the manner and limit of this boiling; for this *Capitellum* becoming thick and concreting into Salt, must not be kept so long upon the fire, until all the moisture shall be vanished and spent by the heat thereof: for thus also the force of the foresaid Medicins, which also consists in a spirituous substance, will be much dissipated and weakned; therefore before it be come to extreme dryness, it shall be taken from off the fire, to wit, when as yet there shall some thick moisture remain, which may not hinder the Cauteries from being made up into a form. The made up Cauteries shall be put up into a Glass most closely luted or stopped, that the air may not dissolve them, and so they shall be laid up and kept in a dry place. Now because the Powder of Mercury is near to Cauteries in the effect and faculty thereof, which therefore is termed *Pulvis Angelicus*, for the excellency, therefore I have thought good to give you the description thereof, which is this:

The description of Mercury or Angelical powder.

℞ *Antripigmenti citrini, floris æris, an.* ʒ ij. *salis nitri,* ℔ j. ß. *alumin. rochæ,* ℔ ij. *vitrioli* ℔ iij. Let them all be powdered, and put into a Retort, having a large Receiver well luted put thereto. Then set the Retort over a Fornace, and let the distillation be made first with a gentle fire, then encreased by little and little, so that the Receiver may wax a little reddish.

℞ *Argenti vivi,* ℔ ß. *aquæ fortis,* ℔ j. *ponantur in phiala, & fiat pulvis, ut sequitur.*

Take a large earthen pot, whereinto put the Vial or bolt-head wherein the *Argentum vivum* and *Aqua fortis* are contained, 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 be in any danger of breaking when all the water is vanished away, which you may know is done when as it leaves smoaking; suffer it to become cold, then take it forth of the ashes, and you shall find calcined Mercury in the bottom, of the colour of red Lead, separated from the white, yellow, or black excrement; for the white that concretes in the top is called Sublimate, which if it should remain with the calcified Mercury, you shall make it into powder, and put it in a brass vessel upon some 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 acrimony and biting, whence it will become less painful in the operation.

CHAP. XXXIII.

Of Vesicatories.

What Vesicatory and rubrifying Medicins are.

VEsicatory and rubrifying Ointments, Cataplasms, or Plasters, are made of acrid Medicins; which have power to draw forth to the superficies of the body such humours as lie deep, by exulcerating the skin and causing blisters. Their matter is the same with septick medicins; as, *Sinapi, anacardus, cantharides, euphorb. radices scyllæ, bryon.* and the like, which with Honey, Turpentine, Leaven, Gum, or Rosin, may be made into Cataplasms, Ointments, or Plasters; therefore the composure of Vesicatories, or rather their consistence differs not from that of hard or soft Unguents. Therefore I will give you one example or description of them, which is this:

The description of a Vesicatory.

℞ *Cantharid. euphorbii, sinapi, an.* ʒ ß. *mellis anacardini,* ʒ j. *modico aceti, & fermenti quod sit satis, excipiantur, & fiat vesicatorium.* Some of the Ancients think it better to make up these Medicins with

with water rather than with vinegar, because experience teacheth that vinegar abates the strength of mustard. We use this kind of medicin in long diseases, when as we cannot any thing prevail with other medicins; especially in the Head-ach, Meagrim, Epilepsie, Sciatica, Gout, the bites and punctures of venomous creatures, pestilent Carbuncles, and other inveterate and contumacious diseases. Their use.

Also we use them when as we would restore life and strength to a dead or decayed part, for thus they are drawn back together with the heat; for which purpose we must make choice of more gentle Vesicatories, as such which onely rubrifie, so that the part may onely become red, and not be burnt: the part must first be strongly rubbed, that the decayed and dull heat may be rouzed and stirred up, the pores of the skin more opened, that the force of the Medicin may enter the deeper into the body.

CHAP. XXXIV.

Of Collyria.

A *Collyrium* is a Medicin proper for the Eyes, made of Powder finely levigated and ground into the form of *Alebobol*, as the Arabians and our Alchymists term it: yet the word in a more generall acception, is used for any liquid Medicin, made with Liquors and Powders, and applied or used to any part. Wherefore *Collyria* are of three kinds, some are moist or liquid, which are properly called *Collyria*; others drie, which are of the same consistence with Trochisces; others have the consistence of Honey, or a liniment. The liquid serve for the greater and lesser corners of the Eyes; those of the consistence of Honey are meet for the Apple of the Eye, but the drie are to be made into Powder, and so blown into the Eyes: also sometimes they are to be dissolved in some juice, or other convenient liquor, that so they may be made into moist *Collyria*. What a *Collyrium* is. The differences of them. Their use.

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 eyes do more readily mitigate the heat of their inflammation, by reason they enter more easily by the tenuity of their substance; such things as have a more firm consistence adhere more tenaciously, and work more certainly. Moist *Collyria* are made of Juices, Mucilages, Waters of Herbs, Flowers, Seeds, Metalline bodies, Galls, and other such like Medicins, which are Repercussives, Resolvers, Detergents, Anodynes, and the like, according to the nature of the present disease.

Sometimes 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 ʒ ij. and liquors to ℥ iv. or ℥ v. in Medicins for the Eyes; but for other parts, as when it is to be injected into the Urinary passage, they may be prescribed to the quantity of a pint. Drie *Collyria* are made of Powders exceeding finely beaten or ground, and incorporated with some 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. Catharetick 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 be made more plainly by the following examples. Their matter.

℞ *Aq. plant. & rosar.* ℥ ij. *albumen ovi unum bene agitatum, misce, fiat collyrium.* ℞ *Aq. rosar. & viol. an.* ʒ iij. *trochisc. alb. Rhas. cum. opio,* ʒij. *fiat collyrium.* Or ℞ *Decoct. fœnug.* ℥iij. *muc. ag. sem. lini,* ℥ij. *saccharum cand.* ʒ j. *croci,* ℈ j. *fiat collyr.* ℞ *Thuris, myrrh.* ℈ij. *tut. præpar. & antimon. lot. an.* ʒij. *cum succo chelidon. fiat collyrium in umbra siccand.* ℞ *Fellis perdic. aut leper.* ʒ j. *succi fœnicul.* ʒ j. *saccharum cand.* ʒ ij. *syrup. rosar. accipiantur, fiat collyrium.* A Repercussive *collyri m.* An Anodyne. A Detergent.

We use *Collyria* in Wounds, Ulcers, Fistulaes, Suffusions, Inflammations, and other diseases of the Eyes.

CHAP. XXXV.

Of Errhines and Sternutatories.

ERrhines are Medicins appointed to be put into the Nose to purge the Brain of its excrementitious humours 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 Errhins, which usually are to purge the head, are made of the juices of Herbs, as Beets, Coleworts, Marjeron, Pimpernel, Hyssop or Balm, or of their decoctions taken alone, or mixed with Wine, or Syrup, as *oxymel scillit.* Syrup of Hyssop, Roses, or *mel anthosat.* sometimes Powders are mixed with the Liquors, as of Pepper, *Euphorb.* Pellitory of *Spain*, Hore-hound, *nigel. Rom. castor.* Myrrh, white Ellebore, Sow-bread, and other like, in a small quantity, to wit, to ʒj. little more or less according to the vehemency of the disease. We will make this more plain by examples. What an Errhine is. Their differences.

℞ *Succi betæ, majoran. brassic. an.* ℥ j. *depurentur, & modice bulliant cum vini albi,* ℥ ij. *oxymel. scillit.* ℥ ß. *fiat Errhinum.* When as you desire to attract more powerfully from the brain, you may dissolve in Errhins some purging Medicins; as Agarick, *diaphœnicon, senna, carthamus*, and the like: hence doth arise the distinction of Errhins into such as are meet to purge phlegm, choler, and melancholy. This following example is set down by *Rondeletius.* ℞ *Rad. pyreth. irid. an.* ʒ j. *puleg. calam. orig. an.* m. j. *agar. trochisc.* ʒiij. *flor. anthos & stœchad. an.* p. j. *fiat decoctio in colatur.* ℔ j. *dissolve mellis anthosati & scillit. an.* ʒiij. *fiat capus purgium.* But it is better to this purpose to make use of purging Simples, as Agarick, Turbith, 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 sieve-like bones, but apt rather there to cause obstruction, and intercept the freedom of respiration. The form of one. An Errhine purging phlegm.

℞ *Succi betæ,* ʒ j. *aq. salv. & betan. an.* ʒ ij. ℈. *castor.* ℈ ß. *piper. & pyreth. an.* ℈ j. *fiat capus purgium.* An Errhin with Powder.

A Sternutatory.

Drie Errhines that are termed ſternutatories, for that they cauſe ſneezing, are made of powders onely, to which purpoſe the laſt mentioned things are uſed; as alſo aromatick things in a ſmall quantity, as to ʒ ij. at the moſt: as, ℞ *Major. nigel. caryoph. zinzib. an.* ϑ j. *acor. pyreth. & panis porcin. an.* ϑ ß. *euphorb.* ϑ j. *terantur, & in nares mittantur, aut inſuffientur.* Errhines of the conſiſtence of Emplaiſters, by the Latins vulgarly called *Naſalia*, are made of the deſcribed Powders or Gums diſſolved in the juice of ſome of the forementioned herbs, incorporated with Turpentine and Wax, that ſo they may the better be made into a pyramidal form to be put into the noſtrils. As ℞ *Majoran. ſalv. nigel.* ϑij. *pip. alb. caryoph. galang. an* ϑ j. *pyreth. euphorb. an.* ʒ ß. *panis porcin. ellebor. alb. an.* ϑ j. *terantur, & in pulverem redigantur.* And then with Turpentine and Wax as much as ſhall be ſufficient, make them up into *Naſalia* of a pyramidal or taper faſhion. We uſe Errhines in inveterate diſeaſes of the brain; as the Epilepſie, fear of blindneſs, an Apoplexy, Lethargy, Convulſion, the loſt ſenſe of Smelling: yet we firſt uſe general remedies and evacuations, leſt by ſneezing and the like concuſſion of the brain for the exclusion of that which is offenſive thereto, there ſhould be made a greater attraction of impurity from the ſubjacent parts. Liquid things muſt be drawn up into the noſtrils warm out of the palm of the hand, to the quantity of ʒ ß. the mouth being in the interim filled with water, leſt the attracted liquor ſhould fall upon the palat, and ſo upon the lungs: drie Errhines are to be blown into the noſe with a pipe or quill: ſolid ones muſt be faſtned to a thred, that they may be drawn forth as need requires, when as they are put up into the noſtrils. The morning (the belly being empty) is the fitteſt time for the uſe of Errhines. If by their force the noſe ſhall be troubled with an itching, the pain thereof muſt be mitigated by Womans milk, or Oil of Violets. The uſe of attractive Errhines is hurtful to ſuch as are troubled with diſeaſes of the Eyes, or ulcers in the noſe, as it oft-times falls out in the *Lues Venerea*: wherefore in this caſe it will be beſt to uſe Apophlegmatiſms which may divert the matter from the Noſe.

The matter of ſolid errhines.

Their uſe.

The manner of uſing them.

To whom they are hurtful.

CHAP. XXXVI.

Of Apophlegmatiſms, or Maſticatories.

What an Apophlegmatiſm is.

The differences.

Apophlegmatiſmi, in Greek, and *Maſticatoria* in Latine, are Medicins which kept or held in the mouth and ſomewhat chawed, do draw by the mouth forth of the brain excrementitious humours, eſpecially phlegm: now they are chiefly made four manner of ways; the firſt is when as the Medicins are received in Honey 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 be held in the mouth. The third is, when as a decoction of acrid Medicins is kept in the mouth for a pretty ſpace. The fourth is, when as ſome acrid Medicin, or otherwiſe drawing phlegm, as pellitory of *Spain*, Maſtich, and the like, is taken of it ſelf to the quantity of a Haſel-nut, and ſo chawed in the mouth for ſome ſpace. The matter of Maſticatories is of the kind of acrid Medicins, as of Pepper, Muſtard, Hyſſop, Ginger, Pellitory of *Spain*, and the like; amongſt which you muſt make choice chiefly of ſuch as are not troubleſom by any ingrate taſte, that ſo they may be the longer kept in the mouth with the leſs offence and loathing. Yet Maſticatories are ſometimes made of harſh or acerb Medicins; as of Berberies, the ſtones of Prunes or Cherries, which held for ſome ſpace in the mouth, draw no leſs ſtore of phlegm than acrid things; for the very motion and rowling them up and down the mouth attracts becauſe it heats, compreſſes and expreſſes: the quantity of the Medicin ought to be from ʒ ß. to ʒ j. ß. as, ℞ *Pyreth. ſtaphyſag. an.* ʒ j. ß. *maſtich.* ʒ ß. *pulverentur & involvant. nodulis in maſticatoria.* Or ℞ *Zinzib. ſinap. an.* ʒ. j. *euphorb.* ϑ ij. *piper.* ʒ ß. *excipiantur melle, & fiant paſtilli pro maſticatoriis.* ℞ *Hyſſop. thym. origan. ſalv. an.* p.j. boil them in water to waſh the mouth withall. Or ℞ *Zinzib. caryoph. an.* ʒ j. *pyreth. pip. an.* ʒ ß. *ſtaphyſagr.* ʒ ij. *maſtiches* ʒ ß, *excipiantur, fiant paſtilli pro maſticatoriis.* We uſe maſticatories in old diſeaſes of the brain, dimneſs of the ſight, deafneſs, puſtles of the head and face, and ſometimes to divert the excrements which run to the Noſe being ulcerated.

The uſe of Maſticatories

To whom hurtful.

Maſticatories are very hurtful to ſuch as have their Mouths or Throats ulcerated, as alſo to them whoſe lungs are ſubject to inflammations, diſtillations and ulcers; for then Errhines are more profitable to derive the matter of the diſeaſe by the noſtrils. For though the humour drawn from the Brain into the mouth by the means of the maſticatory, may be thence caſt forth by coughing and ſpitting, yet in the interim Nature will be ſo inured to that paſſage for the humour, ſo that it will run that way when as we ſleep, and fall down upon the parts thereunder, weak either by Nature or by Accident.

The time fitteſt for the uſe of Apophlegmatiſms is the morning, the body being firſt purged; if any 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 Barley.

CHAP. XXXVII.

Of Gargariſms.

What a Gargle is.

The differences thereof.

A Gargle or Gargariſm is a liquid compoſition fit for to waſh the mouth and all the parts thereof, to hinder defluxion 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, Leaves, Flowers, Fruits, and Seeds fit for the diſeaſe: now the decoction is to be made either in fair water alone, or with the admixture of white or red wine, or in the decoction of Licorice and Barley, or of pectoral things, as the intention of the Phyſician is to repel, cool, or hinder inflammation; as in the tooth-ach cauſed by matter which is yet in motion; to diſcuſs, as in the tooth-ach already at the height;

height; or to cleanse, as in the ulcers of the mouth; or to dry and bind, as when it is fit to heal the ulcers already cleansed.

The other way of making of Gargarisms is without decoction, which is, when as we make them either of distilled Waters onely, or by mixing them with Syrups, Mucilages, Milk, the Whey of Goats milk carefully strained. There are mixed sometimes with a decoction, distilled Waters and Mucilages, *Mel rosatum, oxymel simplex, diamoron, diamucum, 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, Cinamon, drie Roses, and many such things; even so that oft-times there enter into Gargles such Medicins as have force to draw from the brain, as Pellitory of *Spain*, Carthamus, Turbith, and such things as have no bitterness, which is the cause that neither Agarick nor Coloquintida ought to enter into Gargarisms. Their matter.

The quantity of liquor for a Gargarism is commonly from ℔ ß. to ℔ j. mix therewith some ℥ij. of Syrups, but put Powders sparingly, as some ʒ iij. Alum may sometimes be put into ℥ vj. let mucilages be extracted out of ʒ ij. of Seeds: let these serve for some examples.

℞ *Plant. polygon. oxalidis, an.* m. j. *rosar. rub.* pß. *hordei* p j. *fiat decoctio ad.* ℥ viij. *in qua dissolve syrupi myrtillorum,* ℥ vj. *diamucum* ℥ ß. *fiat Gargarisma.* Or, ℞ *Chamamel. anethi. an.* pij. *ros. rub.* p ß. *passul. mund. & ficuum, an.* p iij. *decoquantur in aquis partibus vini & aquæ, ad* ʒ vj. *addendo mucag. sem. lini, & fænugr. an.* ℥ ij. *fiat Gargarisma.* An astringent Gargle. An Anodyne Gargle.

Or else, ℞ *Aq. plantag. lignit. absynth. an.* ℥ij. *mellis rosati colati* ℥ vj. *syrup. rosar. siccar. & de absynth. an.* ℥ vj. *fiat Gargarisma.*

We use Gargles in the Morning fasting after general Purgations; they are sometimes taken or used cold, when as malign, acrid, and thin humours fall down, sometimes warm; but let these things be done according as the Physician shall advise. A deterfive.

CHAP. XXXVIII.

Of Dentifrices.

DEntifrices are Medicins prepared and serving divers ways to cleanse, whiten, and fasten the Teeth; for from their use they take their name. Of these, some are dry, othersome moist: of the dry, some have the form of opiates, others of Powder grossly 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, Harts-horn, Scuttle-bones, Alum, Crystal, Pumice, Salt-nitre, myrrh, Frankincense, *Balaustia*, Acorns, all sorts of shells of Fishes: all these are to be made into Powder either by burning, or without it; for Scuttle-bones burnt cast forth a stinking and unpleasant smell. To these for Smell sake are added certain aromatick things, as Cinamon, Cloves, Nutmegs, and the like: such Powders if mixed with some Syrups, as *oxymel scilliticum*, or form of some fingers length, round and square, and sharp pointed, that dried they may serve for Dentifrices. What a dentifrice is. The differences. The matter whereof they consist.

Sometimes emollient Roots are boiled with Salt or Alum, that dried again they may be used for Dentifrices: moist ones are made of drying herbs distilled together with drying and astringent things.

All the differences shall appear by the following examples. ℞ *Lapidis spong. pumicis & cornu cervi ust. an.* ℥ ij. *coral. rub. & crystal. an.* ℥ j. *alum. & sal. nit. an.* ʒ j. ß. *cinamom. & caryoph. rosar. rub. pulver. an.* ʒ ij. *fiat pulvis pro dentifricio.* Or, ℞ *Ossis sepiæ,* ʒ ß. *masticbes, coralis rubri usti, an.* ʒ ij. *corn. cervi usti,* ℥ j. ß. *aluminis, carbonis, roris mar. an.* ℥ j. *cinam.* ʒ ij. *fiat pulvis pro dentifricio.* Or, ℞ *Ossis sepiæ, alum. & salis usti, an.* ℥ j. *crystalli, glandium, myrrhæ, thuris, aa.* ℈ ij. *corticis granatorum, macis, cinam. an.* ℈ j. *fiat pulvis qui excipiatur mucagine gummi tragacanth. & formentur pyramides longæ, siccand. pro dentifricio.* Or ℞ *Rad. malv. junior. & bismalv. an.* ℥ ij. *coquantur in aqua salsa aut aluminosa, deinde siccentur in furno pro dentifricio.* ℞ *Salis* ʒ vj. *alumin.* ℥ iij. *thuris, masticbes, sanguis draconis, an.* ℥ ß. *aquæ ros.* ℥ vj. *distillentur in alembico vitreo pro dentifricio.* A Powder for a Dentifrice.

Dentifrices are not onely known good to polish, cleanse, and strengthen the teeth; but we 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. Their use.

The Ancients of Lentisk-wood made themselves Tooth-picks, and such devices to strengthen their loose Teeth, which also at this day is in use with those of *Languedoek*, with whom this Wood is plentiful, so that it may be brought thence for the use of Noble-men and Gentlemen; Myrrh may also serve for this same use, and any other astringent Wood.

Our people commonly use the stalks of Fennel, yet have they no faculty to fasten the Teeth, but their smell is grateful.

CHAP. XXXIX.

Of Bags or Quilts.

PHysicians term a bag or *sacculus*, the composition or mixture of drie and powdered Medicins put in a bag; therefore it is as it were a drie fomentation. Their differences are not drawn from any other thing than from the variety of the part whereto they are applied: such as are for the head must be made into the fashion of a Cap; those which be for the whole ventricle must be made into the form of a Cithern; those for the Spleen, like to an Oxes Tongue: lastly, such as are for the Liver, Heart, and other parts, must be 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 some- What a bag or quilt is. Their differences.

ſometimes added Roots, Flowers, Fruits, Rinds, Cordial Powders, and other drie Medicins, which may be eaſily brought into Powder, and conduce to the grieved parts; the quantity is different according to the magnitude of the affected parts: In the Books of Practiſers it is commonly found preſcribed from ʒ iij. to ℥ vj. ß. Sometimes Flowers and dry Herbs are preſcribed by handfuls and pugils: and here there is need of an artificial conjecture to conceive and appoint a fit quantity of Powders: but let us give you ſome examples.

A quilt for the ſtomach. ℞ *Roſar. rub.* p.j. *maſtich.* ℥ ß. *coralli rub.* ʒiij. *ſem. aniſi, & fœnic. an.* ʒ ij. *nucis moſchat.* ʒ j. *ſummitat. abſynth. & menth. an.* m.j. *tritis omnibus, fiat ſacculus conſutus & compunctus pro ventriculo.*

A cap for a cold head. ℞. *Furfuris macri,* p. j. *milii.* ℥ j. *ſalis,* ʒ ij. *roſar. rub. flor. rorifmar. ſtœchados, caryoph. an.* m ij. *fol. beton. & ſalv. an.* ʒiij. *tritis omnibus fiat cucuphæ, interſuta & calefacta fumo thuris, & ſandaracha exuſtorum, capiti apponatur.*

A quilt for the heart. ℞ *Flor. borag. buglo. & violar. an.* p.ij. *cortic. citri ſicci, macis ligni aloes, raſuræ eboris, an.* ʒ j. *oſſis de corde cervi, croci, an.* ℈ ij. *fol. meliſſ.* m. ß. *pulveris diambræ,* ʒ ß. *contritis omnibus fiat ſaccul. e ſerico pro corde, irrorandus aqua ſcabioſæ.*

Their uſe. We 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 Colick, and in a baſtard pluriſie proceeding from flatulencies. The powders muſt be ſtrewed upon carded bombaſt, that they run not together, and then they muſt be ſewed up or quilted in a bag of Linnen or Taffaty.

We often-times moiſten theſe bags in Wine or diſtilled water, and ſometimes not with the ſubſtance thereof, but by the vapour onely of ſuch liquors put into a hot diſh: thus oft-times the bags are heated by the vapour onely, and oft-times at the fire in a diſh by often turning them. Theſe if intended for the heart, ought to be of Crimſon or Scarlet Silk, becauſe the Scarlet-berry, called by the *Arabians Kermes*, is ſaid to refreſh and recreate the heart. Certainly they muſt always be made of ſome fine thing, whether it be Linnen or Silk.

CHAP. XL.

Of Fumigations.

What a Fumigation is. Their differences and matter. A *Suffitus* or Fumigation is an evaporation of Medicins having ſome viſcous and fatty moiſture: of Fumigations ſome are drie, and otherſome moiſt, the drie have the form of Trochiſces or Pills: their matter ought to be fatty and viſcous, ſo that it may ſend forth a ſmoak by being burnt: ſuch are *Ladanum*, Myrrh, Maſtick, Pitch, Wax, Roſin, Turpentine, *Caſtoreum*, *Styrax*, Frankincenſe, *Olibanum*, and other gums, which, may be mixed with convenient Powders: for they yield them a body and firm conſiſtence; the fumigations that are made of Powder only, yield neither ſo ſtrong nor long a fume.

A Cephalick Fume. The quality of the Powders muſt be from ℥ ß. to ℥ j. ß. but the Gums to ʒ ij. as, ℞ *Sandaracha, maſtiches, roſar. an.* ʒ j. *benjoini, galang. an.* ʒ iij. *terebinthin. excipiantur, & fiant trochiſci, quibus incenſis ſuffumigentur tegumenta capitis.* ℞ *Marchaſitæ,* ʒ ij. *bdelii, myrrhæ, ſtyracis, an.* ℥ j. ß. *ceræ flavæ, & terebinth. quod ſufficit, fiant formulæ pro ſuffumigio.* For the hardneſs of the ſinews. ℞ *Cinnabaris,* ʒ ij. *ſtyracis & benjoini, an.* ʒ ij. *cum terebinth. fiant trochiſci pro ſuffumigio per embotum.*

For the relicks of the *Lues Venerea*. We uſe Fumigations in great obſtructions of the Brain, Ulcers of the Lungs, the *Aſthma*, an old Cough, Pains of the Sides, Womb, and the diſeaſes of ſome other parts; ſometimes the whole body is fumigated, as in the cure of the *Lues Venerea* to procure ſweat: ſometimes onely ſome one part whereto ſome relicks of the *Lues* adheres: ſuch Fumigations are made of *Cinnabaris*, wherein there is much *Hydrargyrum*. The Fume muſt be received by a funnel, that ſo it may not be diſperſed, but may all be carried unto the part affected, as is uſually done in the affects of the Womb and Ears.

The manner of uſing them. In fumigations for the Brain and Cheſt, the vapour would be 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 be vailed, that none of the vapour may flie away. Moiſt Fumigations are made ſomewhiles of the decoction of herbs, otherwhiles of ſome one ſimple Medicin boiled in oil; ſometimes a hot fire-ſtone is quencht in Vinegar, Wine, *Aqua Vitæ*, or the like liquor, ſo to raiſe a humid vapour. We oft-times uſe this kind of Fumigation in overcoming ſchirrhous affects, when as we would cut, diſcuſs, penetrate deep, and drie: take this as an example thereof.

The manner of a moiſt Fumigation. ℞ *Laterem uxum ſatis craſſum, aut marchaſitam ponderis* lb j. heat it red hot, and then let it be quencht in ſharp Vinegar, pouring thereon in the mean while a little *Aqua Vitæ*, make a Fumigation for the grieved part.

Fumes of the decoction of Herbs do very 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 be an example of a humid Fumigation.

A moiſt Fume for the ears. ℞ *Abſynth. ſalv. rut. origan. an.* p.j. *rad. bryon. & aſar. an.* ℥ ß. *ſem. ſinap. & cumin. an.* ʒ ij. *decoquantur in duabus partibus aquæ, & una vini pro ſuffitu auris cum emboto:* and oft-times ſuch Fumigations are made for the whole body, whereof we ſhall treat hereafter.

CHAP. XLI.

Of a particular or Half-Bath.

What an *Inſeſſus* is. A *Semicupium* or Half-bath, is a Bath for the one half of the body; that is, for the parts from the belly downwards: it is called alſo an *Inſeſſio*, becauſe the Patient ſitteth to bathe in the decoction of Herbs: in which form and reſpect a *Semicupium* differs from a Fomen-

tation,

tation; for it is compoſed of the ſame matter, to wit a decoction of Herbs, Roots, Seeds, Fruits, but in this the quantity of the decoction is the greater, as we ſhall teach by the following example. The matter.

℞ *Malv. biſmalv. cum toto, an.* m.j. ℈. *beton. ſaxifrag. pariet. an.* m.j. *ſem. melon. malo ſolis, alkekengi, an.* ℥ iij. *cicer. rub.* p. ij. *rad. apii, graminis, fœniculi, eryngii, an.* ℥ j. *decoquantur in ſufficiente aquæ pro inſeſſu.* A half-bath for the ſtone in the kidnies.

We uſe theſe half-baths in affects of the Kidnies, Bladder, Womb, Fundament, and lowerbelly, 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 ſome Bags with the boiled herbs, or other parts of Plants, and cauſe the Patient to ſit upon them; yet in the interim keep the vapours from the head leſt they ſhould offend it, by caſting over it a linnen cloth, or elſe let him not enter thereinto until the vapour be exhaled. The uſe. The manner of uſing it.

CHAP. XLII.

Of Baths.

BAths are nothing elſe than as it were a fomentation of the whole body, both for preſerving health, and the cure of Diſeaſes: this is a very commodious form of Medicin, and among other external Medicins much celebrated by the Greek, Arabian, and Latin Phyſicians. For a Bath, beſides that it digeſts the acrid humours, and ſooty excrements lying under the skin, mitigates pains and wearineſs, and corrects all exceſs of diſtemper: moreover in the cure of Fevers, and many other contumacious and inveterate Diſeaſes it is the chief and laſt remedy, and as it were the refuge of health, ſtored with pleaſing delight. Baths are of two ſorts, ſome Natural, others Artificial. Natural, are thoſe which of their own accord, without the operation or help of Art, prevail or excel in any Medicinal quality. For the water which of it ſelf is devoid of all quality that is perceivable by the taſte, if it chance to be ſtraitned through the veins of Metals, it furniſhes and impregnates it ſelf with their qualities and effects: hence it is that all ſuch water excells in a drying faculty, ſometimes with cooling and attriction, and otherwhiles with heat and a diſcuſſing quality. The Baths whoſe waters being 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 many years, and keep it from being extinct. Some 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 cauſe of ſo great an affect unto God the maker of the Univerſe, whoſe providence piercing every way into all parts of the World, enters and governs the ſecret parts and paſſages thereof. Notwithſtanding they have ſeemed to have come neareſt the truth, who refer the cauſe of heat in Waters unto the ſtore of Brimſton contained in certain places of the Earth, becauſe 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 ſends 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 ſome of Coperas. The Faculties of Baths. Their differences. Natural Baths.

Now you may know from the admixture of what Metalline bodies the Waters acquire their faculties by their taſte, ſent, colour, mud, which adheres to the channels through which the water runs, as alſo by an artificial ſeparation of the more terreſtrial parts from the more ſubtil. For the earthy droſs which ſubſides or remains by the boiling of ſuch waters, will retain 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 we will deſcribe each of theſe kinds of Waters by their effects, beginning firſt with the Sulphureous. How to know whence the Baths have their efficacy.

Sulphureous Waters powerfully heat, dry, reſolve, open, and draw from the center unto the ſurface of the body; they cleanſe the skin troubled with Scabs and Tetters; they cauſe the itching of ulcers, and digeſt and exhauſt the cauſes of the Gout, they help pains of the Colick and hardned Spleens. But they are not to be drunk, not onely by reaſon of their ungrateful ſmell and taſte, but alſo by reaſon of the maliciouſneſs of their ſubſtance, offenſive to the inner parts of the body, but chiefly to the liver. The condition of natural ſulphureous waters.

Aluminous waters taſte very aſtrictively; therefore they drie powerfully, they have no ſuch manifeſt heat, yet drunk, they looſe the belly: I believe by reaſon of their heat and nitrous quality they cleanſe and ſtay 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 themſelves ſufficiently by their heat: they heat, dry, bind, cleanſe, diſcuſs, attenuate, reſiſt putrefaction, take away the blackneſs coming of bruiſes, heal ſcabby and malign ulcers, and help all ædematous tumors. Of ſalt and nitrous.

Bituminous Waters heat, digeſt, and by long continuance ſoften the hardned ſinews; they are different according to the various conditions of the bitumen that they waſh, and partake of the qualities thereof. Of bituminous.

Brazen Waters, that is, ſuch as retain the qualities of braſs; heat, drie, cleanſe, digeſt, cut, bind, are good againſt eating Ulcers, Fiſtulaes, the hardneſs of the Eye-lids, and they waſte and eat away the fleſhy excreſcences of the Noſe and Fundament. Of brazen.

Iron Waters cool, drie, and bind powerfully, therefore they help abſceſſes, hardned milts, the weakneſſes of the ſtomach and ventricle, the unvoluntary ſhedding of the Urin, and the too much flowing terms, as alſo the hot diſtemper of the Liver and Kidnies. Some ſuch are in *Lucan* Territory in *Italy*. Of iron.

Leaden Waters refrigerate, drie, and perform ſuch other operations as Lead doth; the like may be Of Leaden.

be 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 hot baths. How Waters or Baths help cold and moist diseases, as the Palsie, Convulsion, the stiffness and attraction of the Nerves, trembling, palpitations, cold distillations upon the joints, the inflations of the members by a dropsie, the Jaundice by obstruction of a gross, tough, and cold humour, 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 gross, cold, and obstruct humour, for they provoke sweats.

To whom hurtful. Yet such must shun them as are of a cholerick nature, and have a hot liver, for they would cause a *Cachexia* and Dropsie by over-heating the liver.

The faculties of cold baths. Cold Waters or Baths heal the hot distemper of the body and each of the parts thereof, and they are more frequently taken inwardly than applied outwardly; they help the laxness of the bowels, as the resolution of the retentive faculty of the stomach, Entrails, Kidnies, Bladder, and they also add strength to them. Wherefore they both temper the heat of the liver, and also strengthen it, they stay the *Diarrhœa*, Dysentery, Courses, unvoluntary shedding of Urin, the *Gonorrhœa*, Sweats and bleedings. In this kind are chiefly commendable the Waters of the Spaw in the Country of *Liege*, which inwardly and outwardly have almost the same faculty, and bring much benefit without any inconvenience, as those that are commonly used in the drinks and broths of the Inhabitants.

The Spaw.

Of artificial baths. In imitation of natural Baths, there may in want of them be made artificial ones, by the infusing and mixing the Powders of the formerly described Minerals; as Brimstone, Alum, Nitre, Bitumen: also you may many times quench in common or rain water, Iron, Brass, Silver and Gold heated red hot, and so give them to be drunk by the Patient; for such waters do oft-times retain the qualities and faculties of the Metals quenched in them, as you may perceive by the happy success of such as have used them against the Dysentery.

The faculty of a Bath of warm water. Besides these, there are also other Baths made by Art of simple Water, sometimes without the admixture of any other thing, but otherwhiles with medicinal things mixed therewith, and boiled therein. But after what manner soever these be made, they ought to be warm, for warm water humects, relaxes, mollifies the solid parts, if at any time they be too drie, hard and dense; by the ascititious heat it opens the pores of the skin, digests, and attracts, and discusses fuliginous 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 than is fit. To conclude, whether we be too hot or cold, or too drie, or be nauseous, we find manifest profits by Baths made of sweet or warm water, as those that may supply the defect of frictions and exercises: for they being the body to a mediocrity of temper, they increase and strengthen the native colour, and by procuring sweat discuss flatulencies: therefore they are very useful in hectick Fevers, and in the declension of all Fevers, and against raving and talking idlely, for the procuring sleep. But because water alone cannot long adhere to the body, let Oil be mixed or put upon them, which may hold in the water, and keep it longer to the skin.

Why we 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 suppurative to exclusion, when as general remedies according to Art have preceded; for otherwise they will cause a greater defluxion to the afflicted parts: for a Bath (in *Galens* 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 be not muddy, and then Fountain-water; the water of standing Lakes and Fens is not approved of, for it is fit that the water which is made choice of for a Bath of sweet water, should be light and of subtil parts; for Baths of waters which are more than immoderately hot or cold, yield no such commodity but verily they hurt in this, that they shut up or close the pores of the body, and keep in the fuliginous excrements under the skin; other Baths of sweet or fresh water consist of the same matter as Fomentations do; whence it is that some of them relax, others mitigate pain, others cleanse, and othersome procure the Courses, that is compounded of a decoction of Ingredients or Plants having such operations. To these there is sometimes added Wine, otherwhiles Oil, sometimes fresh Butter or Milk, as when the Urin is stopped, when Nephritick pains are violent, when the Nerves are contracted, when the habit of the body wastes and wrinkles with a hectick driness, for this corrugation is amended by relaxing things, but it is watered, as it were fatted by humecting things which may penetrate and transfuse the oily or fatty humidity into the body thus rarified and opened by the warmness of a Bath.

Anodyne Baths are made of a decoction of Medicins of a middle nature, such as are temperate and relaxing things, with which we may also sometimes mix resolving things; they are boiled in Water and Wine, especially in pains of the Colick proceeding from vitreous phlegm, or gross and thick flatulencies contained or shut up in the Belly, Kidnies, or Womb. In such Baths it is not fit to sweat, but onely to sit in them so long until the bitterness of the pain be asswaged or mitigated, lest the powers weakned by pain, should be more resolved by the breaking forth of sweat: emollients are sometimes mixed with gentle detergents, when as the skin is rough and cold, or when the scails or crust of scabs is more hard than usual, then in conclusion we must come to strong detersives and driers; lastly, to drying and somewhat astrictive Medicins so to strengthen the skin, that it may not it self so easie and open to receive defluxions. By giving you one example, the whole manner of prescribing a Bath may appear.

Why we must not continue in the bath till we sweat.

A mollifying and anodyne Bath. *℞ Rad. lilior. bismalv. an.* ℔ ij. *malv. pariet. violar. an.* m. β. *fem. lini, fœnug. bismalv. an.* ℔ j. *flor. cham. melil. aneth. an.* p. vj. *fiat decoctio in sufficienti aquæ quantitate, cui permisceto olei liliorum & lini ana* ℔ ij. *fiat balneum in quo diutius natet æger.*

Cautions to be observed in the use of Baths though noble remedies approved by use and reason, yet unless they be fitly and discreetly used in time, plenty, and quality, they do much harm; for they cause shakings and chilness, pains,

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denſity of the skin, or too much rarefaction thereof, and oft-times a reſolution of all the faculties. Wherefore a man muſt be mindful of theſe cautions before he enter into a Bath: Firſt, that there be no weakneſs of any noble and principal bowel, for the weak parts eaſily receive the humors which the Bath hath diffuſed and rarified, the ways lying open, which tend from the whole body to the principal parts. Neither muſt there be any plenty of crude humours in the firſt region, for ſo they ſhould be attracted and diffuſed over all the body: therefore it is not onely fit that general Purgations ſhould precede, but alſo particular by the Belly and Urine: beſides, the Patient ſhould be ſtrong, that can faſting indure a Bath as long as it is needful. Laſtly, the Bath ought to be in a warm and ſilent place, leſt any cold air by its blowing, or the Water by its cold appulſe, cauſe a ſhivering or ſhaking of the body, whence a Fever may enſue.

The fitteſt time for bathing.

The morning is a fit time for bathing, the ſtomach being faſting and empty, or ſix hours after meat, if it be requiſite that the Patient ſhould bathe twice a day, otherwiſe the meat yet crude would be ſnatched by the heat of the Bath, out of the ſtomach into the Veins and habit of the body. Many, of all the ſeaſons of the year, make choice of the Spring and end of Summer, and in theſe times they chuſe a clear day, neither troubled with ſtormy winds, nor too ſharp an air. As long as the Patient is in the Bath, it is fit that he take no meat, unleſs peradventure to comfort him he take a little bread moiſtned in Wine, or the juice of an Orange, or ſome Damask Prunes to quench his thirſt: his ſtrength will ſhew how long it is fit that he ſhould ſtay in; for he muſt not ſtay there to the reſolution of his powers, for in Baths the humid and ſpirituous ſubſtance is much diſſipated. Coming forth of the Bath, they muſt preſently get them to bed, and be 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 Fricſions, or Walking; then let him feed upon meat of good juice and eaſie digeſtion, by reaſon that the ſtomach cannot but be weakned in ſome ſort by the Bath.

How to order the Patient coming forth of the Bath.

The quantity of meat is judged moderate, the weight whereof ſhall not oppreſs the ſtomach: Venery after bathing muſt not be uſed, becauſe to the reſolution of the ſpirits by the Bath, it adds another new cauſe of further ſpending or diſſipating them. Some wiſh thoſe that uſe the Bath by reaſon of ſome contraction, pain, or other affects of the Nerves, preſently after bathing, to dawb or beſmear the affected nervous part with the Clay or Mud of the Bath, that by making it up as it were in this place, the virtue of the Bath may work more effectually, and may more throughly enter into the affected part.

Theſe cautions being diligently obſerved, there is no doubt but the profit by Baths will be great and wonderful: the ſame things are to be obſerved in the uſe of Stoves, or Hot-houſes, for the uſe and effects of Baths and Hot-houſes is almoſt the ſame, which the ancients therefore uſed by turn, ſo that coming forth of the Bath they entered a Stove, and called it alſo by the name of a Bath, as you may gather from ſundry 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.

The differences of Stoves.

STOves are either drie or moiſt: Drie, by raiſing a hot and drie airy exhalation, ſo to imprint their faculties in the body, that it thereby waxeth hot, and the pores being opened, run down with ſweat. There are divers ways 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 Furnace, whence it being preſently diffuſed, heats the whole Room; Yet every one may make himſelf ſuch a Stove as he ſhall judge beſt and fitteſt.

How made.

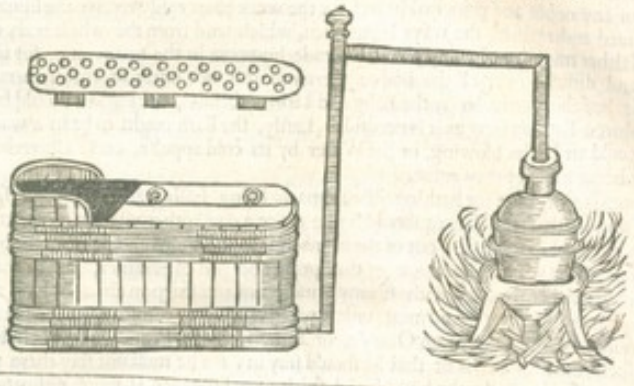
Alſo you may put red hot Cogle-ſtones or Bricks into a Tub, having firſt laid the bottom thereof with Bricks or iron Plates, and ſo ſet a ſeat in the midſt thereof; wherein the Patient ſitting, well covered with a Canopy drawn over him, may receive the exhalation ariſing from the ſtones that are about him, and ſo have the benefit of ſweating: but in this caſe we muſt oft look to and ſee the Patient; for it ſometimes happens that ſome, neglected by their Keepers otherwiſe imployed, become faint, and their ſenſe 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 burnt into their beds. Some alſo take the benefit of ſweating in a Furnace or Oven, as ſoon as bread is drawn out thereof. But I do not much approve of this kind of ſweating, becauſe the Patient cannot as he will, much leſs as he pleaſeth, lie or turn himſelf therein.

A vaporous Stove or Bath.

Humid Stoves or Sudatories are thoſe wherein Sweat is cauſed by a vapour or moiſt heat: this vapour muſt be raiſed from a decoction of Roots, Leaves, Flowers, and Seeds, which are thought fit for this purpoſe; the decoction is to be made in Water or Wine, or both together. Therefore let them all be put into a great veſſel well luted, from the top of whoſe cover Iron or Tin pipes may come into a Bathing Tub ſtanding near thereto, between the two bottoms thereof, by means whereof the hot vapour may enter thereinto, and diffuſe it ſelf therein. Now it is fit the Bathing-tub ſhould be furniſhed with a double bottom, the one below and whole, the other ſomewhat higher and perforated with many holes, whereupon the Patient ſitting, may receive a Sudorifick vapour over all his body: now this vapour, if at any time it become too hot, muſt be tempered by opening the hole, which muſt for the ſame purpoſe be made in the top of the Pipe, that ſo it may be opened and ſhut at pleaſure. In the interim the Tub ſhall be cloſely covered wherein the Patient ſits, he putting forth onely his head, that ſo he may draw in the cold air. In defect of ſuch Pipes the Herbs ſhall be boiled by themſelves in a Caldron or Kettle, and this ſhall be ſet thus hot into the Bathing-tub at the Patients feet, and ſo by caſting into it heated ſtones, a great and ſudorifick vapour ſhall be raiſed.

The

The delineation of a Bathing-tub having a double bottom, with a Veſſel near thereto, with Pipes coming therefrom, and entering 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 filthy luſt, ſeek to beautifie their Faces as baits and allurements to filthy pleaſures: but it is intended for your by Art to take away thoſe ſpots and deformities which have happened to fall on their faces either by accident or Age.

As the colour of the skin is, ſuch is the humour that is thereunder.

The colour that appears in the face, either laudable or illaudable, abundantly ſhews the temper both of the body, as alſo of thoſe humours that have the chief dominion therein: for every humour dies the skin of the whole body, but chiefly of the face, with the colour thereof: for choler bearing ſway in the body, the face looks yellowiſh; phlegm ruling, it looks whitiſh or pale; if melancholy exceed, then blackiſh or ſwarth; but if bloud have the dominion, the colour is freſh and red. Yet there are other things happening externally which change the native colour of the face, as Sun-burning, cold, pleaſure, ſorrow, fear, watching, faſting, pain, old diſeaſes, the corruption of meats and drinks: for the flouriſhing colour of the cheeks is not onely extinguiſhed by the immoderate uſe of Vinegar, but by drinking of corrupt Waters the face becomes ſwollen and pale.

On the contrary, laudable meats and drinks make the body to be well coloured and comely, 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 humours, the body ſhall be evacuated by bloud-lettings if from the infirmity of any principal bowel, that muſt firſt of all be ſtrengthened; but the care of all things belongs to the Phyſician: we 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 colour.

Waters where with to waſh the face.

Firſt the face ſhall be waſhed with the water of Lilly-flowers, of Bean-flowers, Water-lillies, of diſtilled Milk, or elſe with the Water wherein ſome Barley or Starch hath been ſteeped. The dried face ſhall be anointed with the Ointments preſently to be deſcribed; for ſuch waſhing cleanſeth and prepareth the Face to receive the force of the Ointments, no otherwiſe than an alumed Lye prepares the hairs to drink up and retain the colour that we deſire. Therefore the Face being thus cleanſed and prepared, you may uſe the following Medicins, as thoſe that have a faculty to beautifie, extend, and ſmooth the skin: as,

Compound-liquors wherewith to waſh the face.

℞ *Gum. tragacanth. conquaſſ.* ʒ ij. *diſtemperentur in vaſe vitreo cum* ℔ ij. *aquæ communis ſic gummi diſſolventur, inde albeſcet aqua.* Or elſe, ℞ *Lithargyri auri,* ʒ ij. *ceruſ. & ſalis com. an.* ʒ ß. *aceti aquæ plant. camphora in aqua quam inſtituto tuo aptam delegeris:* then filter them both ſeveral and mix them together being ſo filtered, when as you would uſe them.

Virgins milk.

℞ *Lactis vaccini,* ℔ ij. *aranciorum & limon. an.* nu.iv. *ſaccari albiſſimi, & alum. roch. an.* ʒ j. *diſtillentur omnia ſimul:* let Limons and Oranges be cut into ſlices, and then be infuſed in Milk, adding thereto the Sugar and Alum, then let them all be diſtilled together in *Balneo Mariæ*; the water that comes thereof will make the face ſmooth and lovely. Therefore about bed-time it will be good to cover the Face with linnen cloths dipped therein. A Water alſo diſtilled of Snails gathered in a Vine-yard, Juice of Limons, the Flowers of white Mullain mixed together in equal proportion with a like quantity of the liquor contained in the bladders of Elm-leaves, is very good for the ſame purpoſe. Alſo this,

℞ *Micæ panis albi,* ℔ iv. *flor. fabar. roſar. alb. flor. nenuph. lilior. & ireos, an.* ℔ ij. *lactis vaccini,* ℔ vj. *ovæ,* nu.viij. *aceti opt.* ℔ j. *diſtillentur omnia ſimul in alembico vitreo, & fiat aqua ad faciei & manuum lotionem.* Or ℞ *Olei de tartaro,* ℥ iij. *mucag. ſem. pſilii,* ℥ ʒ j. *ceruſ. in oleo roſ. diſſolut.* ʒ j. ß. *borac. ſal. gem. an.* ʒ j. *fiat linimentum pro facie.* Or ℞. *Caponem vivum, & caſeum ex lacte caprino recenter confectum, limon.* nu.iv. *ovor.* nu.iv. *ceruſ. lot. in aq. roſar.* ℥ ij. *boracis,* ʒ j. ß. *camph.* ʒ ij. *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 *ſucus* made of the marrow of Sheeps-bones, which ſmooths the roughneſs of the skin, beautifies the face; now it muſt be 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 ſwims upon it, and therewith anoint

your

your face when as you go to bed, and wash it in the morning with the formerly prescribed Water.

℞ *Salis ceruss.* ℥ ij. *ung. citrin. vel spermat. ceti,* ʒ j. *malaxentur simul, & fiat linimentum, addendo olei ovor.* ʒ ij. The *Sal ceruss'e* is thus made: Grind Ceruss into very fine powder, and infuse ℔ j. thereof in a bottle of distilled Vinegar for four or five days, then filter it, then set that you have filtred in a glazed earthen vessel over a gentle fire until it concrete into Salt, just as you do the *capitellum* in making of Cauteries. How to make *Sal ceruss'e.*

℞ *Excrementi lacert. ossis sepiæ, tartari, vini albi, rasur. corn. cerv. farin. oriz. an. partes æquales, fiat pulvis, infundatur in aqua distillata amygdalarum dulcium, limacum vinealium, flor. nenuph. huic addito mellis albi par pondus:* let them all be incorporated in a marble Morter, 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 anointing it you shall cover the face with a linnen cloth moistned in the former described Water.

℞ *Sublim.* ʒ j. *argent viv. saliv. extincti.* ʒ ij. *margarit. non perforat.* ʒ j. *caph.* ʒ j. ß. *incorporentur simul in mortario marmoreo, cum pistillo ligneo, per tres horas ducantur & fricentur, reducanturque in tenuissimum pulverem, confectus pulvis abluatur aqua myrti & deficcetur, serveturque ad usum, adde foliorum auri & argenti,* nu. x. When as you would use this powder, put into the palm of your hand a little Oil of Mastich, or of sweet Almonds, then presently in that Oil dissolve a little of the described powder, and so work it into an ointment, wherewith let the face be anointed at bed-time: but it is fit first to wash the face with the formerly described water, and again in the morning when you arise.

When the face is freed from wrinkles and spots, then you may paint the cheeks with a rosie and flourishing colour; for of the commixture of white and red ariseth a native and beautiful colour: 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 dry in: there is also Spanish red made for this purpose; others rub the mentioned parts with a Sheeps-skin died red: moreover the friction that is made by the hand onely, causeth a pleasing redness in the face, by drawing thither the bloud and spirits. How to paint the face.

CHAP. XLV.

Of the Gutta Rosacea, *or a fiery face.*

THis Treatise of *Fuci*, puts me in mind to say something 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, sometimes with pustles and scabs, by reason of the admixture of a nitrous and adust humour. Practitioners have termed it *Gutta rosacea.* This shews both more and more ugly in Winter than in Summer, because the cold closeth the pores of the skin, so that the matter contained thereunder is bent up for want of transpiration, whence it becomes acrid and biting, so that as it were boiling up, it lifts or raiseth the skin into pustles and scabs; it is a contumacious disease, and oft-times not to be helped by Medicin. Why worse in Winter then in Summer.

For the general method of curing this disease, it is fit that the Patient abstain from Wine, and from all things in general that by their heat inflame the bloud, and diffuse it by their vaporous substance: he shall shun hot and very cold places, and shall procure that his belly may be soluble, either by Nature or Art. Let bloud first be drawn out of the *basilica*, then from the *vena frontis*, and lastly from the vein of the nose. Let Leeches be applied to sundry places of the face, and cupping-glasses with scarification to the shoulders. Diet.

For particular or proper remedies, if the Disease be inveterate, the hardness shall first be softned with emollient things, then assaulted with the following ointments, which shall be used or changed by the Chirurgeon as the Physician shall think fit. Remedies.

℞ *Succi citri,* ʒ iij. *ceruss. quantum sufficit ad eum inspissandum, argenti vivi cum saliva & sulphure vivo extincti* ʒ ß. *incorporentur simul, & fiat unguentum.* An approved Ointment.

℞ *Boracis,* ʒ ij. *farin. cicer. & fabar. an.* ʒ j. ß. *caph.* ʒ j. *cum melle & succo cepæ fiant trochisci:* when you would use them, dissolve them in Rose and Plantain water, and spread them upon linnen cloths, and so apply them on the night-time to the affected parts, and so let them oft-times be renewed.

℞ *Unguenti citrini recenter dispensati,* ʒ ij. *sulphuris vivi,* ʒ ß. *cum modico olei sem. cucurb. & succi limonum, fiat unguentum:* with this let the face be anointed when you go to bed, in the morning let it be washed away with Rose-water, being white by reason of bran infused therein: moreover sharp Vinegar boiled with Bran and Rose-water, and applied as before, powerfully takes away the redness of the face.

℞ *Ceruss. & litharg. auri, sulphuris vivi pulverisati, an.* ʒ ß. *ponantur in phiala cum aceto & aqua rosarum:* linnen cloths dipped herein shall be applied to the face on the night, and it shall be washed in the morning with the Water of the infusion of Bran: this kind of Medicin shall be continued for a Moneth.

℞ *Sanguinis tauri,* ℔ j. *butyri recentis,* ℔ ß. *fiat distillatio ut stat.* The liquor which is distilled for the first days is troubled and stinking, but those passed, it becometh clear and well smelling. Some boil Bran in Vinegar and the water of Water-lillies, and in this decoction they dissolve of Sulphur and Camphire a fit proportion to the quantity of the decoction, and they apply a cloth moistned in this Medicin to the face in the evening.

℞ *Album. ovor.* nu. ij. *aquæ ros.* ʒ j. ß. *succi plantag. & lapath. acut. an.* ʒ j. ß. *sublimati,* ℈ j. *incorporentur in mortario marmoreo.* ℞ *Axung. porci decies in aceto lotæ,* ʒ iv. *argenti vivi,* ℥ j. *aluminis, sulphuris vivi, an.* ʒ j. *pistentur omnia diu in mortario plumbeo, & fiat unguentum, argentum vivum non debet nisi extremo loco affundi.* ℞ *Rad. lapath. acut. & althodel. an.* ℥ ij. *coquantur in aceto scillitico, postea tundan-*

tundantur, & setaceo trajiciantur, addendo auripigmenti, ʒ ij. sulphuris vivi, ʒ x. let them be incorporated, and make an Ointment to be used to dry up the pustles.

To dry up the Pustles.

℞ *Rad. liliorum sub cineribus coctorum, ℥ iv. pistillo tusis, & setaceo trajectis, adde butyri recentis, & axung. porci, lotæ in aceto, an ℥ j. sulphuris vivi, ℥ iij. camphor. ℈ iij. succi limonum quantum sufficit, malaxentur simul, & fiat unguentum.* ℞ *Lactis virginalis, lb. ß. aluminis, ℥ ß. sulphuris vivi, ℥ j. succi limonum, ℥ iv. salis com. ʒ ß.* let them all be distilled in a glass Alembick, and the water kept for the forementioned uses.

℞ *Lapath. acut. plantag. & asphodel. an ℥ j. ß. olei vitel. ovor. ℥ j. terebinth. venet. ℥ ß. succi limonum, ʒ iij. alum. combust. ʒ j. argenti vivi extinct. ℥ j. olei liliorum, ℥ ß. tundantur omnia in mortario plumbeo, addendo sub finem argent. vivi: ne mortario adhæreſcat.* The juice of Onions beaten with Salt, or Yolks of Eggs are good for the same purpose.

To kill Tetters.

For staying and killing of Ring-worms and Tetters, the leaves of Hellebore beaten with Vinegar are good, the milk of the Fig-tree is good of it self, as also that of the Spurges, or Mustard dissolved in strong Vinegar with a little Sulphur. Or,

℞ *Sulphuris, calcanthi, & aluminis, an. ʒ j. macerentur in aceto forti, trajiciantur per linteum,* apply the expressed juice. Others macerate an Egg in sharp Vinegar, with Coperas and *sulphur vivum* beaten into fine powder, then they strain or press it through a linnen cloth.

But seeing the forementioned Medicins are acrid, and for the most part eating and corroding, it cannot be 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.

℞ *Terebinth. ven. tam diu lotæ, ut acrimoniam nullam habeat, butyri salis expertis, an. ℥ j. ß. olei vitel. ovor. ʒ j. axung. porci in aqua rosarum lotæ, ℥ ß. ceræ parum, fiat linimentum ad usum.* To the same purpose you may also make use of some of the fore-mentioned Medicins.

CHAP. XLI.

To black the Hair.

What things are fit to die the hair.

AT first the hairs (to take the *fucus* or tincture, and to retain it) must be prepared with Lye, wherein a little Roch-alum is dissolved. Thus the fatty scales may be washed and taken away, which hinder, and (as it were) keep away the *fucus*, that it cannot adhere or penetrate into the body of the hair. Then must we come to particular or proper and fitting Medicins for this purpose. These ought to be aromatick and cephalick, and somewhat sliptick, that by their odoriferous and astringent power that may strengthen the animal faculty. Furthermore, they must be of subtil parts, that they may enter even into the inner roots of the hairs.

℞ *Sulphuris, vitrioli, gallarum, calcis vivæ, lithargyri, an. ʒ ij. scoriæ ferri, ʒ ß. in pollinem reducantur, & cum aq. communi incorporentur, ut inde fiat massa:* with this at bed time let the hairs be rubbed, and in the morning let them be smoothed with the same.

℞ *Calcis lotæ, ℥ j. lithargyri utriusque ℥ ß. cum decocto gallarum, corticum nucum, fiat massa, addendo olei chamæm. ʒ ij.* ℞ *Litharg. auri, ℥ ij. ciner. clavellat. ℥ j. ß. calcis viv. ʒ j. dissolve omnia cum urina hominis donec acquirant consistentiam unguenti pro unctione capillorum.* ℞ *Calcis lotæ, ℥ ij. cum decoct. salv. & cort. granat. fiat pasta ad formam pultis satis liquidæ:* let the hair at bed-time be 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 twelve pints of fair water one pound of Lime, then pour out the water by stopping 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 many hours, then in like manner pour it off by stopping 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 pouring of some liquor thereon: as, ℞ *Argenti purissimi, ʒ ij. reducantur in tenuissimas laminnas, ponantur in ampulla vitrea cum ʒ ij. aquæ separationis auri & argenti & aquæ rosar. ʒ vj.* The preparing of this water is thus: put into a Vial the water of separation and the silver, and set it upon hot coals so to dissolve the silver, which being done, 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 quantity: to use it, you must steep the Comb wherewith you comb your head in this water.

A water to black the hair.

To make the hair of a flaxen colour.

℞ *Plumbi usti, ℥ ij. gallarum non perforat. cortic. nucum, an. ℥ iij. terræ sigill. ferret. bisan. an. ℥ ij. vitriol. rom. ℥ vj. salis gem. ℥ j. caryoph. nucis mosch. an. ℥ j. salis ammon. aloes, an. ʒ ß. fiat pulvis subtilissimus:* let this powder be macerated in Vinegar for three days space, then distil it all in an Alembick; the water that comes therefrom is good for the foresaid use. The following Medicin is good to make the hairs of a flaxen colour. ℞ *Flor. genist. stæchad. & cardamom. an. ʒ j. lupinor. conquassat. rasur. buxi, corticis citri, rad. gentian. & berber. an. ℥ j. ß. cum aqua nitri; fiat lenta decoctio:* herewith bathe and moisten the hairs for many days.

CHAP. XLII.

Of Psilothra, *or Depilatories: and also of Sweet Waters.*

A Depilatory.

MEdicins to fetch off hair, which by the Greeks, are termed *Psilothra*, and *Depilatoria* in Latin vulgarly, are made as you may learn by these following examples: ℞ *Calcis vivæ ʒ iij. auripigmenti, ℥ j.* let the lime be quenched in fair water, and then the orpiment added with some aromatick thing: have a care that the Medicin lie not too long upon the part, otherwise it will burn; and this Medicin must be made to the consistence of a Pultis and applied warm, first foment-

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 any excoriation thereupon, you may help it by the use of *Unguentum rosatum*, or some other of the like faculty.

Another.

℞ *Calcis viv. auripig. citrin. an.* ℥ j. *amyl. flumæ argent.* ℥ ß. *terantur & incorporentur cum aq. com. bulliant simul*: you shall certainly know that it is sufficiently boiled, if putting thereinto a Gooses Quill, the Feathers come presently off: some make into powder equal parts of unquenched Lime and Orpiment, they tie them up in a cloth, with which being steeped in water, they besmear the part, and within a while after by gentle stroaking the head, the hair falls away of it self. The following Waters are very fitting for to wash the hands, face, and whole body, as also Linen, because they yield a grateful smell: the first is Lavender-water thus to be made. ℞ *Flor. Lavend.* ℔ iv. *aquæ rosar. & vini alb. an.* ℔ ij. *aq. vitæ,* ℥ iv. *misceantur omnia simul, & fiat distillatio in balneo Mariæ*: the same Water may also be had without distillation, if you put some Lavender 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. ℞ *Caryoph.* ℥ ij. *aq. rosar.* ℔ ij. *macerentur spatio* xxiv. *horarum, & distillentur in balneo Mariæ.* Sweet-water commonly so called, is made of divers odoriferous things put together; as thus, ℞ *Meliss. thæ, marjoranæ, hyssopi, salviæ, rorismarini, lavendulæ, an.* m.ij. *radicis iridis,* ℥ ij. *caryophillorum, cinamomi, nucis moschatæ, ana* ℥ ß. *limonum* nu. iv. *macerentur omnia in aqua rosarum, spacio viginti quatuor horarum, distillentur in balneo Mariæ, addendo Moschi* ∋ ß.

Sweet Waters.

Lavender Water.

Clove Water.

Sweet Water.

The End of the Six and Twentieth Book.

BOOK XXVII.

OF DISTILLATION.

CHAP. I.

What Distillation is, and how many kinds thereof there be.

HAving finished the Treatise of the Faculties of Medicins, it now seems requisite that we speak somewhat of Chymistry, and such Medicins as are extracted by fire. These are such as consist of a certain fifth essence separated from their earthy impurity by Distillation, in which there is a singular, and almost divine efficacy in the cure of Diseases. So that of so great an abundance of the Medicins, there is scarce any which at this day Chymists do not distil, or otherwise make them more strong and effectual than 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 some semblable heat (as the matter shall seem to require) is extracted or drawn, being first resolved into vapour, and then condensed again by cold. Some call this Art *Sublimation*, or Subliming, which signifies nothing else but to separate the pure from the impure; the parts that are more subtil and delicate from those that are more corpulent, gross, and excrementitious; as also to make those matters whose substance is more gross, to become 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 distillation is the extraction or effusion of moisture distilling drop by drop, from the nose of the Alembick, or any such like Vessel. Before this effusion or falling down of the Liquor, there goes a certain concoction performed by the virtue of heat, which separates the substances of one kind from those of another that were confusedly mixed together in one body, and so brings them into one certain form or body, which may be good and profitable for divers Diseases. Some things require the seat of a clear fire, others a flame, others the heat of the Sun, others of Ashes, or Sand, or the Filings of Iron; others Horse-dung, or boiling Water, or the oily vapour or steam thereof. In all these kinds of fires, there are four considerable degrees of heat. The first is contained in the limits of warmth, and such is warm water, or the vapour of hot Water. The second is a little hotter, but yet so as the hand may abide it without any harm; such is the heat of ashes. The third exceeds the vehemency 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 any thing that cometh 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 dry, as those things which are odoriferous and aromatical, as Cinamon, Ginger, Cloves. The third is fittest to distil such things as are of a more dense substance and fuller of Juice; such as are some Roots and Gums. The fourth is fit for Metals and Minerals, as Alum, Vitriol, Amber, Jet, &c. In like manner you may distil without heat; as we 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 earthy, as we 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 setling, or by a vessel made of Ivy wood: sometimes also some things may be distilled by coldness of humidity, and we 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 Furnaces.

The matter the best for Furnaces.

THE matter and form of Furnaces uses to be diverse; for some Furnaces use to be made of Bricks and Clay, otherſome of Clay onely, which are the better and more lasting, if so be the Clay be fat and well tempered with Whites of Eggs and Hair. Yet in sudden occasions when there is present necessity of distillation, Furnaces may be made of Bricks, so laid together that the joints may not agree, but be unequal; for so the structure will be the stronger. The best and fittest form of a Furnace for distillation is round; for so the heat of the fire carried up equally diffuses it self every way, which happens not in a Furnace of another Figure, as square or triangular, for the corners disperse and separate the force of the fire. Their magnitude must be such as shall be fit for the receiving of the Vessel. For their thickness so great as necessity shall seem to require. They must be made with two bottoms, distinguished as it were into two Forges, one below which may receive the ashes of the coals or the like other fuel, the other above to contain the burning coals or fire. The bottom of this upper must either be an iron grate, or else it must be perforated with many holes, that so the ashes may the more easily fall down into the bottom, which otherwise would extinguish the fire; yet some Furnaces have three partitions, as the Furnace 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 calcined or else distilled. The third ought to have a semicircular cover, that so the heat or flame may be reflected upon the contained matter. The lower partition shall have one or more doors, by which the fallen-down ashes may be taken forth, but the upper must have but one whereby the coals or wood may be put in. But in the top or upper part of the Furnace where it shall seem most fit, there shall be 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 Ovens mouth. But in defect of a Furnace, or fit matter to build one withall, we may use a Kettle, set upon a Treefot, after the manner that we shall presently declare, when we come to speak of that distillation which is to be made by *Balneum Mariæ*.

A round form the best for Furnaces.

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 else earthen Vessels; and these are sometimes leaded, sometimes not: or else they are of Gold, Silver, or Glass. Now for leaden Vessels they are worse than the rest, and utterly to be refused, especially when as the liquors which are drawn by them are to be taken into the body by the mouth, by reason of the malignant qualities which are said to be in Lead; by which occasion *Galen* condemns those waters which run, and are contained in leaden pipes, which by reason of their saltishness and acrimony which savors of Quicksilver, cause Dysenteries. Therefore you may perceive such Waters as are distilled through a leaden head to be indued with a more acrid and violent piercing vapour, by reason the portion of that saltness dissolved in them, and as it were shaven from the Alembick, or head, defiles the distilled Liquors, and whitens and turns them into a milky substance: but Copper or Brass heads are more hurtful than Lead, for they make the Waters that come through them to savour or participate of Brass. Those that are of Gold and Silver are less hurtful; but the greatness of the cost hinders us from making heads of such Metals; therefore we must have a great care that our Vessels for Distillation be either of Potters metal leaded, or else of Brass, or of that Jug-metal which is commonly called *Terra Betouacensis*, and these rather than of Lead, or any 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 variety of Vessels for distillation in form and figure; for some 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 Chymists. Of this almost infinite variety of Figures I will in fit place give you the delineation and use of such as shall seem to be most necessary.

Leaden Vessels ill.

Brass worse.

The best Vessels for Distillation.

CHAP. IV.

What things are to be considered in Distillation.

FIrst make choice of a fit place in your house for the Furnace, so that it may neither hinder any thing, nor be in danger of the falling of any thing that shall lie over it. When you shall distil any thing of a malign or venenate quality, ye shall stand by it as little as you may, lest the vapour should do you any harm: when you provide Glass Vessels for Distillation, make choice of such as are exquisitely baked, without flaws or cracks, and such as are every where smooth. Let not the fire at first be very violent, not onely for fear of breaking the Vessels, but also for that the first fire in Distillation must be gentle, and so increased by little and little. The things to be distilled ought not to be put in too great quantity into the body of the Still, lest they should rise up or flie over; but things that they may be more effectual must be twice or thrice distilled, by pouring upon them their own distilled Water, or other fresh materials, or else by distilling them severally and by themselves: of this kind are Gums, Wax, Fats, or Oils.

How things must be often distilled.

But

But in each other repeated distillations you must something 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, Cinnamon, &c. as also the chymical oils of Sage, Rosemary, Thyme, &c. ought not to be distilled or rectified over again, for that we must presently after the first distillation have a diligent care to separate them from the phlegm, that is the more watery substance of the whole liquor, to which purpose we must have regard to that which is distilled, for there are some things which send over their phlegm, as Vinegar, others wherein it comes 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 be distilled another taste or smell than that which they have naturally, you may mix them with some odoriferous thing, as Cinnamon, Camphire, or Musk, or the like, as you please, and so distil them together. The distilled liquors drawn by the heat of ashes or sand, savour 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 fiery impression may exhale, and the *Phlegmon* be consumed, if that there shall be any. But though in all distillation there are many things to be observed, yet are there two things chiefly worthy of note. The first is, the matter that is to be distilled and wrought upon, that is, of what kind it is, and what the Nature thereof may do and suffer. The other is the Furnace, which ought to be provided of a convenient matter, and figure of that which is to be distilled; for you cannot draw any thing of any matter, neither of every mixture being distilled, can you rightly expect Oil or Water: For mixt bodies do not consist of an equal portion of the four Elements, but some are more aery, others more fiery, some participate more of the Water, others more of the Earth, and that presently from their original. Therefore as watery things yield more Water; so airy and fiery things yield more Oil when they are distilled; neither are all instruments fit for the extracting of every liquor. Moreover you must note, that the watery liquor sometimes comes forth in the first place, and presently after by the help of a stronger fire follows the oily, which we find happens as often as the Plant or parts of the Plants which are distilled, are of a cold temperament; for in hot things it happens otherwise, for the first liquor which comes forth is oily, and the following watery.

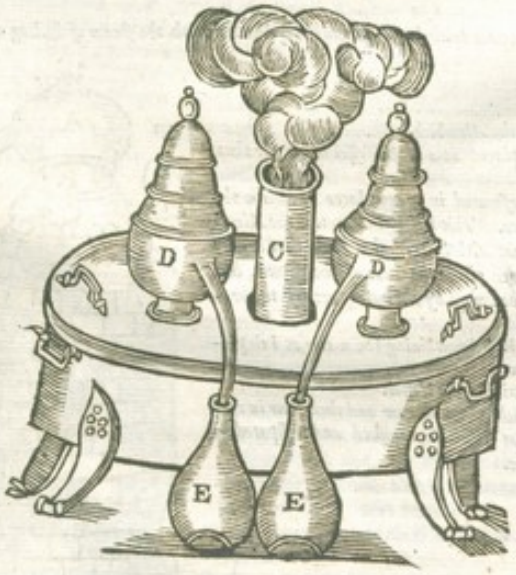
CHAP. V.

Of what fashions the Vessels for the distilling of Waters ought to be.

FOr the distilling of any kind of Waters, two kind of Vessels are necessary, which are comprehended under this original name of an Alembick. They call one of them the body, or containing Vessel, the other the head, that is, the cap or top, wherein the ascending vapours are condensated or turned into water. It is called the head, because it stands over the body, like as an head; from the head there comes out a pipe or nose, whereby the distilled liquor flows drop by drop into the Receiver, as you may see by the Figure.

The parts of an Alembick.

Of what fashion the Vessels for the distilling of Waters ought to be.



A *Shews 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 Chimney added to the Kettle, wherein the fire is contained to heat the water.* D *The Alembick consisting of his body and head.* E *The Receiver whereinto the distilled liquor runs.*

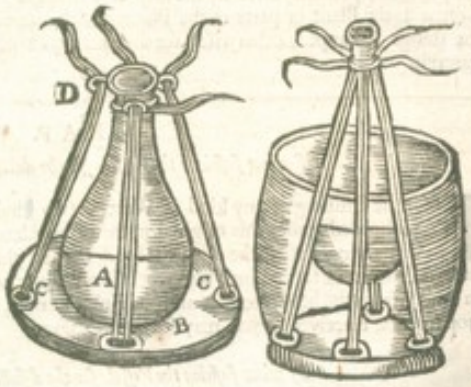
The Effigies of another Balneum Mariæ, *not so easily to be removed as the former.*

A *Shews the Vessel of Copper that contains the Water.*
B *The Alembick set in water.*

But lest the bottom of the Alembick being 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 way and means to prevent that danger.

A *Shews the Vessel or Glass Alembick.*
B *A plate of Lead whereon it stands.*
C *Strings that binds 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 vapour or steam of boiling water, if so be that you be provided of Vessels and forms made after this following manner.



A Furnace with his Vessels to distil liquors with the steam of boiling water.

A *Shew the head of the Alembick.*
B *The body thereof, placed in a brass Vessel made for that purpose.*
C *A brass Vessel perforated in many places to receive the vapour of the Water. This Vessel shall contain the Alembick compassed about with Saw-dust, not only that it may the better and longer retain the heat of the vapour, but also lest it should be broken by the hard touch of the brazen Vessel.*
D *Shews the brass Vessel containing the water as it is placed in the Furnace.*
E *The Furnace containing the Vessel.*
F *A Funnel by which you may now and then pour in water, in stead of that which is vanished and dissipated by the heat of the fire.*
G *The Receiver.*

Why those things that are distilled in *Balneo Mariæ* retain 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, because they do not onely retain the smell of the things which are distilled, but also the taste, acidity, harshness, sweetness, bitterness, and other qualities, so that they will neither savor of smoak nor burning; for the mild and gentle heat of a bath contains by its humidity, the more subtil parts of the Plants that are distilled, that they may not be dissipated and

and exhaled, contrary to which it usually happens in things which are distilled by the burning heat of Wood or Coals: for these have a certain nitrous and acrid taste, savouring of the smoak of fire. Besides, they acquire a malign quality from the vessels out of which they are distilled, especially if they be of Lead, whence they contract qualities hurtful to the principal, vital, and natural parts.

Therefore the Plants which are thus distilled, if they be bitter by nature, presently become insipid, as you may perceive 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 quality. Therefore the matters so drawn are more effectual and pleasing in taste, smell, and sight. You may draw Waters not onely from one kind of plant, but also from many compounded and mixed together: of these some are alimentary, others Medicinal, yea and purging; others acquired for smell, others for washing or smoothing of Womens faces, as we shall shew hereafter.

CHAP. VI.

How the materials must be prepared before Distillation.

THings before they be put in the Alembick must undergo a preparation, that is, they must be cut small, beaten and macerated, that is, steeped in some liquor, that so they may be the more easily distilled and yield the more water, and retain their native smell and faculties; yet such preparation is not convenient for all things; for there be some things which need no incision or maceration, but must rather be dried before they be distilled, as Sage, Thyme, Rosemary, and the like, by reason of their too much humidity; it will be sufficient to sprinkle other things with some 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 be infused. The time of the infusion is different according to the variety of the matter to be macerated; for things that are hard, solid, dry or whole, must be longer macerated than such as are tender, freshly gathered or beaten: whence it is that Roots and Seeds require a longer time of infusion; flowers and leaves a shorter, and the like of things. The liquors where infusion must be made, ought to be agreeable to the other things infused. For hot ingredients require hot liquors, and cold such as are cold, wherein they may be infused.

What things need not to be macerated before they be dissolved.

Such things as have not much juice, as Betony, Wormwood, and the like, or which are very odoriferous, as all aromatick things, would be infused by Wine; so to preserve their smell, which otherwise by the force of the fire, by reason of the tenuity of the subtstance easily vanishes. But if we desire that the distilled liquor should more exactly retain and have the faculty of the things whereof it is distilled, then must you infuse it in the juice thereof, to some such appropriate liquor that it may swim in it whilest it is distilled, or at least let it be sprinkled therewith.

The maceration of Plants in their own juice.

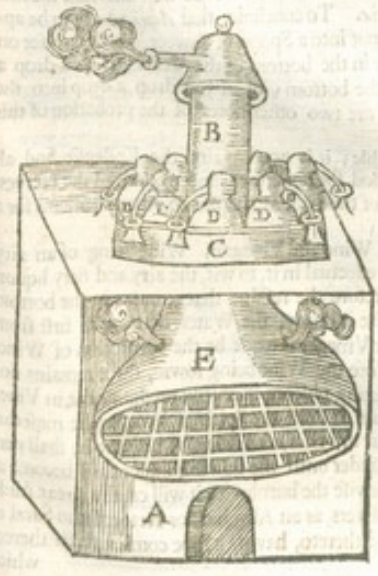
CHAP. VII.

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 many sorts of distilled Waters there be, and what the faculties of them are. Therefore of Distilled Waters some are medicinal, as the Waters of Roses, Plantain, Sorrel, Sage, and the like: others are alimentary, as those Waters that we call Restauratives; othersome 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 Rhubarb; othersome serve for smoothing the skin, and others for smell; of which sort are those that are distilled of aromatick things.

The varieties of distilled waters.

The delineation of a Balneum Mariæ, *which may also serve to distil with ashes.*



To distil Rose-water, it will be good to macerate the Roses before you distil them for the space of two or three days, in some formerly distilled Rose water, or their pressed-out juice, luting the Vessel close; then putting them into an Alembick closely luted to his head and his Receiver, and so put into a *Balneum Mariæ*, as we have formerly described.

Rose-water.

A *Shews the Furnace with the hole to take forth the ashes.*
B *Shews another Furnace as it were set in the other: now it is of Brass, and runs through the midst of the Kettle made also of Brass, that so the contained water or ashes may be the more easily heated.*
C *The Kettle wherein the Water, Ashes or Sand, are contained.*
D *The Alembick set in the Water, Ashes or Sand, with the Mouths of the Receivers.*
E *The bottom of the second brass Furnace, whose top is marked with* B, *which contains the fire.*

The distilled Alimentary liquors are nothing else than those that we vulgarly call Restauratives; this is the

Restauratives.

the manner and art of preparing them. Take of Veal, Mutton, Kid, Capon, Pullet, Cock, Partridge, Pheasant, as much as shall seem fit for your purpose: cut it small, and left it should require heat, or *empyreuma* from the fire, mix therewith a handful of French Barley, and of red Rose-leaves dry and fresh, but first steeped in the juice of Pomgranats, or Citrons and Rosewater with a little Cinnamon.

But if you desire that this Restaurative should not onely be Alimentary, but also Medicinal, you shall add thereto such things as shall resist the disease, such as are Cordial Powders, as of *El. Diamargarit. frigid. de gemmis, aromat. rosat.* Conserve of Bugloss, Borrage, Roots, Herbs, Seeds, and other things of that kind. But if it be in a pestiferous season, Treacle, Mithridate and other Antidotes shall be added; each of these shall be laid in ranks or orders one over another, which is vulgarly termed *stratum super stratum*, in a glass Alembick, and distilled in *Balneo Mariæ* with the heat of Ashes, or else of warm Sand, as the Figure shews.

Another way of making restaurative Liquors.

There may be made other Restauratives in shorter time with less labour and cost. To this purpose the flesh must be 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, Cotton 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 be kept upright by the formerly described means; then make a gentle fire thereunder, until the contained flesh by long boiling shall be dissolved into juice, and that will commonly be in some four hours space. This being done, let the fire be taken from under the Kettle, but take not forth the Glass before the Water be cold, left the fire being hot it should be broken by the sudden appulse of the cold air. Wherefore when as it is cold, let it be opened, and the thred with the pieces of flesh be drawn forth, so that onely the juice may be left remaining; then strain it through a bag, and aromatize it with Sugar and Cinnamon, adding a little juice of Citron, Verjuice or Vinegar, as it shall best like the Patients palat.

After this manner you may quickly, easily, and without great cost have and prepare all sorts of Restauratives, as well medicated as simple. But the force and faculty of purging Medicins is extracted after a clean contrary manner than the Oils and Waters which are drawn of aromatick things, as Sage, Rosemary, Thyme, Anniseeds, Fennel, Cloves, Cinnamon, Nutmegs, and the like. For the strength of these, as that which is subtil and airy, flies upward in distillation; but the strength of purging things, as Turbith, Agarick, Rhubarb, and the like, subsides in the bottom. For the purgative faculty of these purgers inseparably adheres to the bodies and substances.

Now for sweet Waters and such as serve to smooth the skin of the face, they may be 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 sowre or musty, nor otherwise corrupt, or of the Lees, that quantity which may serve to fill 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 becomes. Therefore some 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 twenty four pints of Wine or Lees, draw six or eight pints of distilled liquor.

At the second time the half part, that is, three or four pints.

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 be a great deal the more efficacious. I do well like that the first distillation be made in Ashes, the second in *Balneo Mariæ*. To conclude, that *Aqua vitæ* is to be approved of, neither is it any oftner to be distilled, which put into a Spoon or Sawcer, and there set on fire, burns wholly away and leaves no liquor or moisture in the bottom of the Vessel; if you drop a drop of oil into this same Water, it continually falls 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 asswages the pain of the Teeth, it is good for punctures and wounds of the Nerves, Faintings, Swounings, Gangrenes and mortifications of the flesh, as also put to other Medicins for a vehicle.

The distilling of Wine and Vinegar is different.

There is this difference between the distilling of Wine and Vinegar; Wine being of an airy and vaporous substance, that which is the best and most effectual in it, to wit, the airy and fiery liquor, comes from it presently at the first distillation. Therefore the residue that remains in the bottom of the vessel, it is of a cold dry and acrid nature; on the contrary, the Water that comes first from Vinegar, being distilled, is insipid and flegmatick. For Vinegar is made by the corruption of Wine, and the segregation of the fiery and airy parts; wherefore the Wine being sowre, there remains nothing of the former substance but phlegm; wherefore seeing phlegm is chiefly predominant in Vinegar, it first rises in distillation. Wherefore he that hopes to distil the Spirit of Vinegar, he must cast away the phlegmatick substance, that first substance that first rises, and when by his taste he shall perceive the spirit of Vinegar, he shall keep the fire thereunder until the flowing liquor shall become as thick as honey; then must the fire be taken away, otherwise the burning of it will cause a great stink.

The Vessels fit to distil *Aqua Vitæ* and Vinegar are divers, as an Alembick or Retort set in Sand or Ashes; a Copper or Brass bottom of a Still, with a head thereto, having a Pipe coming forth thereof which

which runs into a Worm or Pipe fastned in a Barrel or Vessel filled with cold Water, and having the lower end coming forth thereof; whose figure we shall give you when as we come to speak of the drawing of Oils out of Vegetables.

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 be performed in 12 or 15 days. The first way. There is another better way 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 figrs. The second.

A Retort with his Receiver, standing upon Chrystal bowls, just opposite to the Sun-beams.

A *Shews the Retort.*
B *The Receiver.*
C *The Chrystal bowls.*

Another Retort with his Receiver, standing in a Marble or Iron Mortar, directly opposite to the Sun.

A *Shews the Retort.*
B *The Marble or Iron Mortar.*
C *The Receiver.*

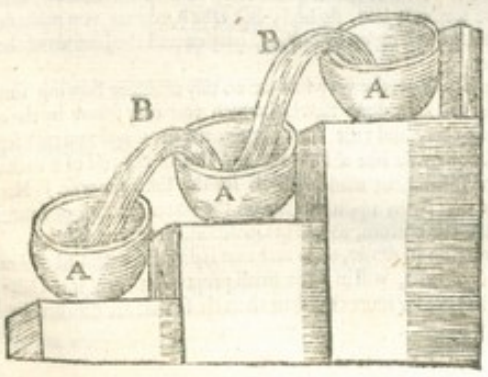
CHAP. X.

Of Distillation by filtring.

YOu shall set three Basins or Vessels of convenient matter in that site and order that each may be higher than other; that which stands in the highest place, shall contain the liquor to be distilled; and that which stands lowest shall receive the distilled liquor. Out of the first and second Vessel shall hang shreds or pieces of Cloth or Cotton, 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 stands under it; but the grosser and more fæculent 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 many Vessels one under another after the fore-mentioned manner, and so put shreds into each of them, so that the lowest Vessel may receive 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 Virgins milk, of which this is the description. ℞ *Litharg. auri diligenter pulverisat.* ℥ iij. *macerentur in aceti boni* ℥ vj. *trium horarum spatio, seorsim etiam in aqua plantag. solani, rosar. aut commun. sal. infundatur*; then distil them both by shreds, then mix the distilled liquors, and you shall have that which for the milky whiteness is termed Virgins Milk; being good against the rednes and pimples of the face, as we have noted in our Antidotary. *Lac Virginis.* *cap.* 44. *of fac.*

The description of Vessels to perform the distillation or filtration by shreds.



A *Shews the Vessel.*
B *The Cloths or Shreds.*

CHAP.

CHAP. XI.

What, and how many ways there are to make Oils.

Oils by Expression.

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 be contained 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 Dane-wort, and of Bay-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 ascent or by descent, or by concourse: The first way 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 a 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 Cucumers, Pistick-nuts, and all such oily things.

By Infusion.
By Distillation

Oil of Bayberries.

Oil of Bays may be made of ripe Bay-berries newly gathered; let them be beaten in a Mortar and so boiled in a double Vessel, and then forthwith put into a Press, so to extract Oil as you do from Almonds, unless you had rather get it by boiling as we have formerly noted.

Of Eggs.

Oil of Eggs is made of the Yolks of Eggs boiled very hard; when they are so, rub them to pieces with your fingers, then fry them in a Pan over a gentle fire, continually stirring them with a Spoon until they becom red, and the Oil be 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 choice of good Oil, wherein let Plants, or Creatures, or the parts of them be macerated for some convenient time, that is, until they may seem to have transfused their faculties into the Oil, then let them be boiled, so strained or pressed out. But if any aquosity remain, let it be evaporated by boiling. Some in compounding of Oils add Gums to them, of which though we have formerly spoken in our Antidotary, yet have I thought good to give you this one example. ℞ *Flor. hyper.* ℔ β. *immittantur in phialam cum flo. cent. & gum. elemi, aa.* ℥ ij. *olei com.* ℔ ij. Let them be exposed all the heat of Summer to the Sun. If any will add *Aqua vitæ* wherein some Benzoin is dissolved, he shall have a most excellent Oil in this kind. Oil of Mastich is made *Ex olei rosati* ℥ xij. *mastich.* ℥ iij. *vini optimi* ℥ viij.. Let them all be boiled together to the consumption of the Wine, then strain the Oil and reserve it in a Vessel.

Oil of St. *Johns* Wort.

CHAP. XII.

Of extracting of Oils of Vegetables by Distillation.

What Oils are to be drawn by Expression.

ALmost all herbs that carry their Flowers and Seeds in an umble, have seeds of a hot, subtil, and airy substance, and consequently oily. Now because the oily substance that is contained in simple bodies, is of two kinds; therefore the manner also of extracting is two-fold. For some is gross, earthy, viscous, and wholly confused and mixed with the bodies out of which they ought to be drawn, as that which we have said is usually extracted by Expression; this because it most tenaciously adheres to the grosser substance and part of the body, therefore it cannot by reason of this natural grosness, be lifted up, or ascend. Othersome are of a slender and airy substance, which is easily severed from their body, wherefore being put to distillation it easily rises: such is the oily substance of aromatick things, as of Juniper, Anniseeds, Cloves, Nutmegs, Cinamon, Pepper, Ginger, and the like odoriferous and spicy things. This is the manner of extracting Oils out of them; let your matter be well beaten and infused in water to that proportion, that for every pound of the material, there may be ten pints of water; infuse it in a Copper bottom, having a head thereto either tinned or silvered over, and furnished with a cooler 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 contained in the head shall wax hot, you must draw it forth, and put in cold, that so the Spirits may the better be condensed, and may not flie away: you shall put a long necked Receiver to the nose of the Alembick, and you shall increase the fire, until the things contained in the Alembick boil.

The first manner of drawing Oils by distillation.

Another way.

There is another manner of performing this distillation: The matter preserved and infused as we have formerly declared, shall be put in a brass or copper bottom covered with his head, to which shall be fitted, or well luted, a Worm of Tin; this Worm shall run through a barrel filled with cold water, that the Liquor which flows forth with the Oil, may be cooled in the passage forth; at the lower end of this Worm you shall set your Receiver. The fire gentle at the first, shall be increased by little and little, until the contained matter, as we 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 containing vessel, and so violently flie over.

Observing these things, you shall presently at the very first see an oily moisture flowing forth together with the watrish. When the Oil hath done flowing which you may know by the colour 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 the same purpose.) Here you must also note that there be some Oils that swim upon the top of the water, as Oil of Anniseeds; othersome on the contrary, which fall to the bottom, as Oil of Cinamon, 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 Anniseed and Cinamon, is whitish, and in success of time, will in some small proportion turn into Oil. Also these Waters must be kept several, for they are far more excellent than those that are distilled by *Balneo Mariæ*,

Mariæ, especially those that first come 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 many pounds of this or that Medicin, is after distillation contracted into a few drams. For example, the faculty that was dispersed over one pound of Cloves, will be contracted into two ounces of oil at the most: and that which was in a pound of Cinamon will be drawn into ℥ j. ℈. or ℥ ij. at the most of Oil. But to draw the greater quantity 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 quality from the Copper: for the waterish moisture that flows forth together therewith will hinder it, especially if the Copper shall be tinned or silvered over. I have thought good to describe and set before your eyes the whole manner of this operation.

A Furnace with set Vessels to extract the Chymical Oils, or Spirits of Sage, Rosemary, Tyme, Lavender, Anniseeds, Fennel seeds, Cloves, Nutmegs, Cinamon, Pepper, Ginger, and the like; as also to distil the spirit of Wine, of Vinegar and Aqua Vitæ. *Instead of the Barrel and Worm, you may use a head with a bucket or rowler about it.*

A *Shews the bottom, which ought to be of Copper and tinned on the inside.*
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 because we have made mention of Cinamon, Pepper, and other Spices which grow not here with us, I have thought good to describe these out of *Thevets* Cosmography, he having seen them growing. Pepper grows upon Shrubs in *India*, these Shrubs send forth little branches whereon hang clusters of Berries, like to Ivy-berries, or bunches of small black Grapes or Currans: the leaves 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 come to perfect maturity. Wherefore it oft-times happens that there are more than 200 Ships upon the Coast of the lesser *Java*, an Island of that Country, to carry thence Pepper and other Spices. Pepper is used in Antidotes against Poisons; it provokes urin, digests, attracts, resolves, and cures the bites of Serpents. It is properly applied and taken inwardly against a cold stomach: in Sauces it helps concoction and procures appetite: you must make choice of such as is black, heavy, and not flaccid. The Trees which bear white, and those that bear black Pepper, are so like each other, that the Natives themselves know not which is which, unless when they have their fruit hanging upon them, as the like happens upon our Vines which bear black and white Grapes. The uses thereof.

The Tree that yields Cinamon grows in the Mountains of *India*, and hath leaves very like to Bay-leaves: 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 we term Cinamon. This is sold to no stranger unless at the Kings pleasure, and he setting the price thereof, it is not lawful for others to cut thereof. The Cinamon Tree.

Galen writes that Cinamon is of very subtil parts, hot in the third degree, and partaking of some astriction; therefore it cuts and dissolves the excrements of the body, strengthens the parts, provokes the Courses when as they stop by reason of the admixture of gross humours: it sweetens the breath, and yields a fine taste and smell to Medicins, Hippocras, and Sauces. Of Cinamon there is made an excellent Water against all cold Diseases, and also against Swounings, the Plague, and Poisons. The composition thereof is this: Take of the choicest and best Cinamon one pound, beat it grossly, and put thereto of Rose water four pints, of white wine half a pint: being 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. *Galen. 7. Simp.* An excellent Cinamon Water.

CHAP. XIII.

Another manner how to draw the Essence and Spirits of Herbs, Flowers, Seeds, and Spices; as also of Rhubarb, 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, Rhubarb, Cinamon, or any other Material you please, cut it small, or else beat it, then put it into a Glass with a long neck, and pour thereupon as much *Aqua vitæ* as shall be sufficient to cover the Materials or ingredients, and to over-top them some fingers bredth, then stop up the Glass very close, that no air enter thereinto: Thus suffer it to infuse for eight days in *Balneo*, with a very gentle heat; for thus the *Aqua vitæ* will extract the faculties of the Ingredients

dients which you shall know that it hath done, when as you shall see it perfectly tinctured with the colour of the ingredients. The eight days ended, you shall put this same *Aqua vitæ* into another Vessel filled with the like quantity 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, until the *Aqua vitæ* be deeply tinctured with the colour of the infused Ingredients.

A sign that the spirit of Wine hath fetcht out the strength of the ingredients.

But if the materials from whence you desire to extract this spirit or essence, be of great price, as *Lignum Aloes, Rhubarb, &c.* you must not think it sufficient to infuse it once onely, but you must go over it twice, or thrice, until all the efficacy be extracted out thereof; you may know that it is all wholly insipid.

A sign that the Ingredients have lost their strength.

These things thus done, as is fitting, put all the liquor tinctured and furnished with the colour and strength of the Ingredients, into an Alembick, filled and closely luted to its 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 honey, set it in an earthy-pot well leaded, upon hot ashes, so that the thin part thereof may be 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 be more powerful in purging, than two or three drams of the thing it self.

CHAP. XIV.

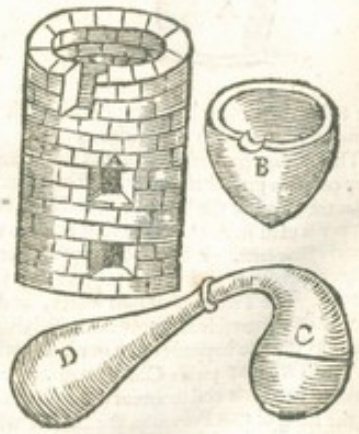
How to extract Oil out of Gums, condensed Juices, and Rosins, as also out of some Woods.

What a Retort is.

ALL Oils that are drawn out of Gums, Oily Woods, and Metals, are extracted by that vessel which we vulgarly term a Retort. It must be made of Glass, or Jug-metal, well leaded, and of such bigness as shall be convenient for the operation you intend, though commonly it should be made to hold some gallon and an half of water; the neck thereof must be 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 be set in an earthen filled with ashes, or Sand, and so set into a Fornace, as you may see by this Figure.

The Figure of a Fornace, with his earthen Pan and Receiver.

A *Shews the Fornace.* B *The earthen Pan or Vessel to set the Retort in.* C *The Retort or Cucurbite.* D *The Receiver.*



The differences of Gums.

Of Gums, some are liquid, some solid; and of the solid, some are more solid than othersome; those that are solid are more troublesom to distil than the liquid, for they are not so easily dissolved or melted, neither do they yield so well to the fire, so that oft-times they are burnt before they be dissolved; whence it is that some for every pound of solid Gum, add two or three pounds of most clear and liquid Oil of Turpentine. Besides, liquid things are also hard to be distilled, because when as they come to be through-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 be that the fire be too hot at the first. Many to shun this inconvenience, add to the things put into the Retort, some Sand, as it were to balast it withal,

Cautions in distilling of Gums.

How to make Oil of Turpentine.

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 empty, and for every 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 contained materials should run over; increase this fire by little and little, and take heed that the things become not too hot on a sudden. At the first a clear and acid liquor will drop out, wherein a certain sediment uses to concrete; then will flow forth a most clear oil, somewhat resembling the watry and phlegmatick liquor: then must the fire be somewhat increased, that the third oily, clear, thin, and very golden coloured liquor may rise and distil: but then also a clearer and more violent fire must be raised, that so you may extract an Oil, that will be red like a Carbuncle, and of a consistence indifferently thick. Thus therefore you may extract four kinds of Liquors out of Turpentine, and receive them being different in several Receivers; yet I judge it better to receive them all in one, that so by distilling them again afterwards you may separate your desired Oil; now there will ten or twelve ounces of Oil flow from a pound of Turpentine. This kind of Oil is effectual against the Palsie, Convulsions, Punctures of the Nerves, and wounds of all the nervous parts.

How to make Oil of Wax.

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 we mentioned a little before in drawing Oil of Turpentine, then distil it, by increasing the fire by degrees. There distils nothing forth of Wax, besides an oily substance and a little *Phlegma*, yet portion of this oily substance presently concretes into a certain butter-like matter, which therefore would be distilled over again: you may draw ʒ vj. or vij. of Oil from one pound of Wax. This Oil is effectual against Contusions, and also very good against cold affects.

The faculties thereof.

CHAP.

CHAP. XV.

Of extracting Oils out of the harder sorts of Gums; as Myrrh, Mastich, Frankincense, and the like.

SOme there be who extract these kinds of Oils with the Retort set in Ashes or Sand, as we mentioned in the former Chapter, *Of Oils of more liquid Gums*, adding for every pound of Gum two pints of *Aqua Vitæ*, and two or three ounces of Oil of Turpentine, then let them infuse for eight or ten days in *Balneo Mariæ*, or else in Horse dung; then set it to distil in a Retort. Now this is the true manner of making Oils of Myrrh; Take Myrrh made into fine Powder, and therewith fill hard Eggs in stead of their Yolks, being taken out; then place the Eggs upon a Gridiron, or such like Grate, in some moist place, as a Cellar, and set under them a Leaden-earthen pan; the Myrrh will dissolve into an oily water, which being presently put into a Glass and well stopped, with an equal quantity of rectified *Aqua Vitæ*, and so set for three or four moneths in hot Horse dung, which past, the vessel shall be taken forth, and so stopped that the contained liquor may be poured into an Alembick, for there will certain gross setling 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 colour by mixing therewith some Alkanet, and a smell by dropping thereinto a little Oil of Sage, Cinamon, or Cloves. How to make Oil of Myrrh. How to give it a pleasing colour 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 Surgery; and is this,

℞ *Terebinth. opt.* ℔ j. *ol. laur.* ℥ iv. *gum. elem.* ℥ iv. ℔. *thuris, myrrhæ, gum. hederæ, centaur. majoris, ligni aloes, an.* ℥ iij. *galangæ, caryophyl. consolidæ majoris, Cinamomi, nucis moschat. zedoariæ, zinzib. dictamni albi, an.* ℥ j. *olei vermium terrestrium,* ℥ ij. *aquæ vitæ* ℔ vj. *Vesalius* his Balsam.

The manner of making it is thus; Let all these things be beaten and made small, and so infused for three days space in *Aqua Vitæ*, then distilled in a Retort, just as we 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 colour, the third of the colour of a Carbuncle, which is the true Balsam. The first liquor is effectual against the weakness of the stomach coming of a cold cause, for that it cuts phlegm and discusses flatulencies; the second helps 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,* ℔ ij. *olei de semine lini,* ℔ j. *resinæ pini,* ℥ vij. *thuris, myrrhæ, aloes, mastiches, sarcocol. an.* ℥ iij. *macis ligni aloes, an.* ℥ ij. *croci* ℥ ℔. Let them all be put into a glass Retort, set in ashes and so distilled. First there will come forth a clear water, then presently after a reddish oil, most profitable for wounds. *Fallopius* his Balsam.

Now you must know that by this means we may easily distil all Axungiaes, Fats, parts of Creatures, Woods, all kinds of Barks and Seeds, if so be that they be first macerated as they ought to be, yet so that there will come forth more watry than oily humidity. Now for that we formerly frequently mentioned *Thus* or Frankincense, I have here thought good out of *Thevets* Cosmography to give you the Description of the Tree from which it flows. The Frankincense Tree (saith he) grows naturally in *Arabia*, resembles a Pine, yielding a moisture that is presently hardned, and it concretes into whitish clear grains, fatty within, which cast into the fire, take flame. Now Frankincense is adulterated with Pine-rosin and Gum, which is the cause that you shall seldom find that with us, as it is here described; you may find out the deceit thus, for that neither Rosin nor any other Gum takes flame; for Rosin goes away in smoke, but Frankincense presently burns. The smell also bewrays the counterfeit, for it yields no grateful smell as Frankincense doth. The *Arabians* wound the Tree that so the liquor may the more readily flow forth, whereof they make great gain. It fills up hollow ulcers and cicatrizes them; wherefore it enters as a chief ingredient into artificial Balsam; Frankincense alone made into Powder and applied, stanches the bloud that flows out of the wounds. What Frankincense is. The faculties thereof.

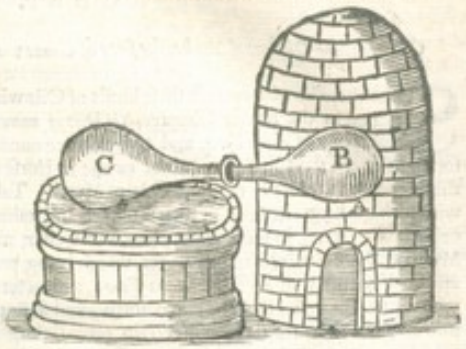
Matthiolus saith, that it being mixed with Fullers-earth, and oil of Roses, is a singular remedy against the inflammation of the Brests of Women lately delivered of child.

CHAP. XVI.

The making of Oil of Vitriol.

TAke ten pounds of Vitriol, which being made into Powder, put it into an earthen pot, and set it upon hot coals until it be calcined, which is when as it becomes reddish; after some five or six hours, when as it shall be throughly cold, break the pot, and let the Vitriol be again made into Powder, that so it may be calcined again, and you shall do thus so often and long until it shall be perfectly calcined, which is when as it shall be exactly red; then let it be made into Powder, and put it into an earthen Retort, like that wherein *Aqua fortis* is usually drawn, adding for every pound of your calcined Vitriol of Tile-sherds, or powdered Brick one quarter; then put the Retort furnished with its Receiver into a Fornace of Reverberation, always keeping a strong fire, and that for the space of 48 hours, more or less according to the manner and plenty of distilling liquor. You shall know the distillation is finished when as the Receiver shall begin to recover his native perspicuity, being not now filled with vaporous spirits, wherewith as long as the humour distills it is replenished and looks white. The sign of perfectly calcined vitriol.

A Furnace or Reverberation furnished with his Retort and Receiver.



Now for the Receiver there are two things to be observed. The first is, that it be great and very capacious, that it may not be 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 be broken by being over-hot; you may easily perceive all this by this Figure.

A *Shews the Furnace.*
B *The Retort.*
C *The Receiver.*
D *The Vessel filled with cold Water.*

CHAP. XVII.

A Table or Catalogue of Medicins and Instruments serving for the Cure of Diseases.

MEdicins and Medicinal meats fit for the cure of Diseases, are taken from living Creatures, Plants, and Minerals. From living Creatures are taken, *Horns, Hoofs, Hairs, Feathers, Shells, Sculls, Scales, Sweats, Skins, Fats, Flesh, Blood, Entrails, Urin, Bones, Extreme parts, Heart, Liver, Lungs, Brain, Womb, Secundine, Testicles, Pizzle, Bladder, Sperm, Tail, Coats of the Ventricle, Excrements, Bristles, Silk, Webs, Tears, Spittle, Honey, Wax, Eggs, Milk, Butter, Cheese, Marrow, Rennet.*

Smells whether they be stinking or sweet, as also Poisons: whole Creatures themselves: as, *Foxes, Whelps, Hedg-hogs, Frogs, Worms, Crabs, Cray-fishes, Scorpions, Horseleeches, Swallows, Dungs.*

From Plants, that is, Trees, Shrubs, and Herbs, are taken, *Roots, Moss, Pith, Sions, Buds, Stalks, Leaves, Flowers, Cups, Fibers, or Hairy threads, Ears, Seeds, Bark, Wood, Meal, Juices, Tears, Oils, Gums, Rosins, Rottenness, Mass or Spissament, Manna,* which falling down like Dew upon Plants presently concretes. Whole Plants, as *Mallows, Onions,* &c.

Metals or Minerals are taken either from the Water or Earth, and are either kinds of Earth, Stones, or Metals, &c. The kinds of Earth are, *Bole-Armenick, Terra sigillata, Fullers-earth, Chalk, Ocar, Plaster, Lime.* Now the kinds of Stones are, *Flints,* Lapis Judaicus, Lapis Lyncis, *the Pumice,* Lapis Hæmatites, Amiantus, Galactites, *Spunge-stones, Diamonds, Sapphire, Chrysolite, Topace, Load-stone, the* Pyrites *or Fire-stone, Alabaster, Marble, Crystal,* and many other precious Stones. The kinds of Salts as well Natural as Artificial are, *Common Salt,* Sal Nitrum, Sal Alkali, Sal Ammoniacum, *Salt of Urin, Salt of Tartar,* and generally all Salts that may be made of any kind of Plants. Those that are commonly called Minerals, are, *Marchasite, Antimony, Muscovy-glass, Tutty, Arsnick, Orpiment, Lazure, or Blue, Rose-agar, Brimstone, Quick-silver, White Coperas, Chalcitis, Pssry, Roman Vitriol, Colcother, Vitriol or Green Coperas,* Alumen scissile, *Common Alum,* Alumen Rotundum, Alumen liquidum, Alumen plumosum, Borax *or Burrace,* Bitumen, Naptha, Cinnabaris, *or Vermilion, Litharge of Gold, Litharge of Silver,* Chrysocolla, Scandaracha, *Red Lead, White Lead, and divers other.* Now the Metals themselves are, *Gold, Silver, Iron, Lead, Tin, Brass, Copper, Steel, Lattin,* and such as arise from these; as the *Scales, Verdigrease, Rust,* &c. Now from the Waters, as the Sea, Rivers, Lakes, and Fountains, and the mud of these Waters, are taken divers Medicins, as *White and Red Coral, 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 eyes, whether to the surface of the Earth, or the bowels thereof, a great multitude of Remedies present themselves to your view. The choice of all which is taken from their substance, or quantity, quality, action, place, season, smell, taste, sight, figure, and weight, other circumstances, as *Sylvius* hath abundantly shewed in his Book written upon this Subject. Of these Simples are made divers 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, Aglutinatives, Anodynes, Apozemes, Julips, Syrups, Powders, Tablets, Opiats, Conserves, Preserves, Confections, Rowls, Vomits, Sternutatories, Sudorifick, Clysters, Pessaries, Suppositories, Fumigations, Trochisces, Frontrails, Caps, Stomachers, Bags, Baths, Half-baths, Virgins Milk,* Fuci, *Picatives, Depilatories, Vesicatories, Potential Cauteries, Nose-gays, Fans, Canopies, or* extended cloths to make wind, *Artificial Fountains* to distil or drop down Liquors.

Now those that are thought to be nourishing Medicins are, *Restauratives, Cullises, Expressions, Gellies, Ptisans, Barly-creams, Panadoes, Almond milk, Marsh-panes, Wafers, Hydrosaccher, Hydromel,* and such other drinks; *Mucilages, Oxymel, Oxycrate, Rose-Vinegar, Hydralium, Methreglin, Sider, Drink of Cervices, Ale, Beer, Vinegar, Verjuice, Oil, Steeled Water, Water brewed with Bread-crums, Hippocras, Perry,* 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 be 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 be a Receiver, put and closely luted thereto. All kinds of Salt of things calcined, dissolved in Water, and twice or thrice filtred, that so they may become more pure and fit to yield Oil.

Other

Other Distillations are made either in Cellars by the coldness or moistness of the place, the things being laid either upon a Marble, or else hanged up in a Bag; and thus is made Oil of Tartar, and of Salts, and other things of an aluminous nature.

Bones must be distilled by descent, or by the joining together of Vessels. All Woods, Roots, Barks, Shells of Fishes, and Seed, or Grains, as of Corn, Broom, Beans, and other things whose juice cannot be got out by expression, must be distilled by descent, or by the joining together of Vessels in a Reverberatory Fornace.

Metals calcined and having acquired the Nature of Salt, ought to be dissolved and filtred, and then evaporated till they be drie; then let them be dissolved in distilled Vinegar, and then evaporated and dried again; for so they will easily distil in a Cellar upon a Marble or in a Bag. Or else by putting them into a glassie Retort, and setting it in Sand, and so giving Fire thereto by degrees, until all the watery humidity be distilled; then change the Receiver, and lute another close to the Retort, then increase the Fire above and below, and thus there will flow forth an Oil very red coloured. Thus are all Metalline things distilled, as Alums, Salts, &c.

Gums, *Axungie*, and generally all Rosins, are distilled by a Retort set in an earthen Vessel filled with Ashes upon a Fornace; now the fire must be increased by little and little according to the different condition of the distilled matters.

The Vessels and Instruments serving for Distillation 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. Crucibles and another such. Vessels for Calcination, Hair-strainers, Bags, Earthen Platters. Vessels for circulation, as Pelicans, Earthen Basins for filtring, Fornaces, the secret fornaces of Philosophers, the Philosophers Egg, Cucurbites Retorts, Bolt-heads, Urinals, Receivers, Vessels so fitted together that the lowermost receives the mouth of the uppermost, whence they may be termed conjoined Vessels: they are used in distilling per descensum. *Marbs exquisitely smooth for distillations to be made in Cellars, Pots to dissolve calcined Metals in.*

A Catalogue of the Surgeons Instruments mentioned in this whole Work.

Rings wherein little Lancets lie hid, to open Impostbumes. Trunks or hollow Instruments going with springs. A vent, or cooler for the womb made like a Pessary. Hollow Tents. Sundry Canteries, as flat, round, sharp-pointed, cutting, &c. Constrictory rings to twitch or bind the Columella. Speculum Oris, Ocul. Ani, Uteri. *A Trunk or Pipe with an actual Cautery in it. Crooked Knives. A Pipe in form of a Quill. Divers Trusses, with one or more bolsters. A shoulder-band to be put about the neck, to hold up a Truss. A Needle to draw through a golden Wier, &c. Pipes with fenestels, and Needles 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 else 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 withall. Levatories of which kind is the three-footed one. Old Levatories, which taken up by their handles, and their tongues being put under the depress bones, lift them up. Saws. A Desquamatory Trepan. Pliers to take forth splinters of bones. A Gimblet to perforate the skull. A Trepan fit to divide the skull, with the Screw, Point, or Piercer, Brace, and Cover or Cap, that keeps it from running in too far. A Plate to set one foot of the Compass upon. A cutting pair of Compasses both open and strait, a fit instrument to depress the* Dura Mater *without hurting thereof. A Syringe to make injection withall. 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, Parats, Swans, Ducks, Lizards, Cranes, are either strait, 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 flamulaes into wounds; and these are either strait or crooked, perforated or unperforated. Screwed Mullets to draw forth barbed heads of arrows, and the like. Lancets to let blood, and scarifie, as well strait as crooked. A Pyulcos, or Matter-drawer. Ligatures, Bands, Swathes, Thongs of Leather, Woollen, Linnen, round, flat, sown together, Again some are upper binders, other under-binders. Again, these are either expressing or else containing, and that either the applied Medicin, 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, Bolsters, doubled Cloths.* Ferulæ, *or Splints. Cases, Boxes, Junks, Glessocomies.* Ambi, *a kind of Glessocomy. A Pully with its wheels, and wooden, and iron Pins whereon the wheels may run. Ropes as well to draw and extend, as hold up the member, &c. Screw-pins, A Handvice, Hooks, Buttons or Stays to fasten to the skin to hold together the lips of the wounds, Lint cushions, Pillows, Linnen Cloths. Files,* Dentiscalpia, Dentifricia, Dentispicia. *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 cleanse the Bladder. Spatulaes straight and crooked. Cupping-glasses, Horns, Pipes, or Catheters to wear Caruncles. Artificial members, as Eyes 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 withall. Pessaries both long and oval. Syringes to give Glysters, as also to make injection into the Ears and Womb.*

The Effigies of *HIPPOCRATES* of *COOS*, the Prince of PHYSICIANS.

INvictum, Hippocrates, *quòd te potuere ſuperbæ*
Eoî numquam 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 morbo
Pæonias fueris promere largus opes;
Sed tua tam fundit, quàm magni machina Mundi
Gratia, & inſignis tam tua fama volat.

BON. GRA. *Pariſ. Medic.*

SELECT

SELECT APHORISMS concerning SURGERY,

Collected out of the Aphorisms of the *Great* HIPPOCRATES.

Aphor. 27. *Sect.* 6. WHosoever being 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, Bloud-letting, or Purging, help the pains of the Eyes.

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. Goury pains usually stir in the Spring and Fall.

28. 6. Eunuchs are not troubled with the Gout, neither do they become bald.

49. 6. Whosoever are troubled with the Gout, have ease in forty days, the inflammation ceasing.

66. 5. In great and dangerous Wounds, if no swelling appear, it is ill.

67. 5. Soft tumours are good, but crude ones ill.

25. 6. For an *Erysipelas*, or Inflammation to return from without inwards, it is not good; but to come from within outwards, is very good.

19. 7. An *Erysipelas* coming upon the bearing of a bone, is evil.

20. 7. Putrefaction or suppuration coming upon an *Erysipelas*, is ill.

21. 6. If *Varices* or Hæmorrhoids happen to such as are mad, their madness ceases.

21. 7. A flux of bloud ensuing upon a great pulsation in ulcers, is ill.

26. 2. It is a better that a Fever happen upon a Convulsion, than 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 deadly whereby the Bladder, Brain, Heart, Midriff, any of the small Guts, Stomach, or Liver are hurt.

45. 6. Whatsoever Ulcers are of a years continuance or more, the bone must necessarily scale, and the scars become hollow.

2. 7. The bone being affected, if the flesh be livid, it is ill.

14. 7. Stupidity and lack of Reason upon a blow on the Head, is evil.

24. 7. A *Delirium* happens if a bone (to wit, the skull) be cut even to the hollowness thereof.

Whilest *Pus* or matter is in generating, Pains and Fevers happen rather than when it is already made.

18. 5. Cold things are hurtful to the Bones, Teeth, Nerves, Brain, Spinal Marrow; but hot things are good.

46. 2. Two Pains infesting together, but not the same place, the more vehement obscures the other.

74. 7. A corruption, an Abscess of the bone is caused by the corruption of the flesh.

50. 6. *Coacar. prænot.* a livid or drie Ulcer, or yellowish, is deadly.

19. 6. When as a Bone, or Gristle, or Nerve, or small portion of the Cheek, or the Prepuce is cut asunder, it neither increases, nor grows together.

24. 6. *Aph.* & 513. *Coacar.* If any of the small guts be cut, it knits not again.

50. 7. Those that have the Brain sphacelate, that is, corrupt, they die within three days; if they escape these, they recover.

9. 7. Bleeding at a wound causing a Convulsion, is the fore-teller of death.

20. 5. Cold is biting to Ulcers, hardens the skin, causes pain, not easily coming to suppuration, blackness, aguish shakings, convulsions, cramps.

50. 8. *Coac.* Those who have the Temples cut, have a convulsion upon the parts contrary to the Section.

44. 7. Whosoever being suppurate are burnt or cut, if pure and white quitture shall flow forth, they escape; but if that which is bloudy, 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 leave them, one foretelling the end of the disease.

Celsus, cap. 10. *lib.* 20. It is better to trie a doubtful remedy than none at all.

The Effigies of *GALEN* the Prince of PHYSICIANS next to HIPPOCRATES.

ÆQuum erat Hippocratem *divino è semine Divûm*
Orbem muneribus conciliare sibi:
Scripta sed involvit tam multo ænigmate, verum
Ut quamvis solers nullus habere queat;
Pergameì auxilio nisi sint monimenta Galeni,
Qui doctâ ambages sustulit Arte senis;
Ergò mâcte esto virtute, arcana resolvens,
Quæ nulli fuerant nota, Galene, *priùs;*
Obstringensque orbem æterno tibi munere totum,
Æternis sacras te quoque temporibus.

BON. GRA. *Paris. Medic.*

Rules

Rules of Surgery by the AUTHOR.

1. PRactice is an Operation agreeable to the Rules and Laws of the Theory.
2. Health is not received by Words, but by Remedies fitly uſed.
3. Remedies known and approved by Uſe and Reaſon, are to be preferred before ſuch as are unknown, or but lately found out.
4. Science without Experience gets the Phyſician no great credit with the Patient.
5. He that would perform any great and notable Work, muſt diligently apply himſelf to the knowledge of his ſubject.
6. It is the part of a good Phyſician to heal the diſeaſe, or certainly to bring it to a better paſs, as Nature ſhall give leave.
7. The Surgeon muſt be active, induſtrious, and well-handed, and not truſt too much to Books.
8. He 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 ſets forth himſelf for a brave Surgeon, for that he hath read much, he is either much deceived or impudent.
9. He ſhall never do any thing praiſe-worthy that hath got his Maſtery in Surgery by Gold, not by Uſe.
10. You ſhall comfort the Patient with hope of Recovery, 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 Diſeaſe prove long, yet it is not fit that the Phyſician give over the Patient.
13. Great wounds of large Veſſels are to be judged deadly.
14. Every contuſion muſt be brought to ſuppuration.
15. As the nature or kind of the diſeaſe muſt be known, ſo alſo muſt the remedy.
16. An Abſceſs of the bone of the Palat, is in danger to cauſe a ſtinking breath.
17. Bleeding cauſed by heat, muſt be repreſt by cold.
18. Wounds of nervous parts require Medicins which by the ſubtilty of the parts may enter in and draw from far.
19. It is not fit for ſuch as have Ulcers in their Legs, either to walk, ſtand or ſit, but to reſt themſelves in bed.
20. All biting and acrid Medicins 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 admits no cure but cutting.
23. A monſter is a thing diſſenting from the Laws of Nature.
24. Wounds of the Cheſt preſently become ſanious and purulent.
25. The wounds made by all venomous Creatures are dangerous.
26. The South wind blowing, wounded members eaſily become mortified.
27. Such as are wounded, and deſire to be quickly whole, muſt keep a ſpare diet.
28. Untemperate bodies do not eaſily recover of diſeaſes.
29. Round Ulcers, unleſs they be drawn into another figure, do not eaſily heal up.
30. An Eryſipelatous Ulcer requires purgation by ſtool.
31. Crying is good for an Infant, for it ſerves in ſtead of exerciſe and evacuation.
32. Grief is good for none but ſuch as are very fat.
33. Idleneſs weakens and extinguiſheth the native heat.
34. An ill-natured Ulcer yields not, unleſs to a powerful Remedy.
35. A Bath reſolves and diſcuſſes humours, and gently procures ſweat.
36. Cold diſeaſes are troubleſom to cold people, and hard to be 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 a hot diſtemper than of a cold, by reaſon of the quick and active operation of fire.
40. The quitture that flows from an ulcer is laudable, which is white, ſmooth and equal.

The End of the Seven and Twentieth Book.

BOOK

BOOK XXVIII.

How to make Reports and to Embalm the Dead.

Why a Surgeon must be careful in making of Reports.

NOw it onely remains that we inſtruct the Surgeon in making and framing his Report or Opinion, either of the Death of any perſon, or of the weakneſs or deprivation of any member in the function or execution of its proper office and duty. Herein it is meet that he be very conſiderate, that is to ſay, ingenious or wiſe in making his Report, becauſe the events of Diſeaſes are often-times doubtful and uncertain, neither can any man fore-tell them certainly, whether they will be for life or death, by reaſon of the manifold nature of the Subject of which we ſpeak, and alſo the uncertain condition of the humours both in their kind and motion. Which was the cauſe why *Hippocrates* even in the firſt of his Aphoriſms pronounceth that Judgment is difficult. But firſt of all, it is very expedient that a Surgeon be of an honeſt mind, that he muſt always have before his eyes a careful regard of true piety, that is to ſay, the fear of God and faith in Chriſt, and love toward his Neighbors, with hope of life everlaſting, leſt that he being carried away by favour, or corrupted with money or rewards, ſhould affirm or teſtifie thoſe wounds to be 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.

What judgment is difficult.

Wounds termed great for three reſpects.

It is recorded in the Works of ancient Phyſicians, that Wounds may be called great for three reſpects. The firſt is by reaſon of the greatneſs of the diſſolved Unity, or reſolution of Continuity; 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 Breſt. The ſecond is by reaſon of the dignity or worthineſs of the part; now this dignity dependeth on the excellency of the action; therefore thus any little wound made with a Bodkin, or Knife, in any part whoſe ſubſtance is noble, as in the Brain, Heart, Liver, or any other part whoſe action and function is neceſſary to preſerve life, as in the Weaſon, Lungs, or Bladder, is judged great. The third is, by reaſon of the greatneſs and ill habit, or the abundance of ill humours, or debility of all the wounded body; ſo thoſe wounds that are made in the nervous parts, and old decaied people, are ſaid to be great. But in ſearching of wounds let the Surgeon take heed that he be not deceived by his Probe. For many times it cannot go into the bottom of the wound but ſtoppeth and ſticketh by the way, either becauſe he hath not placed the Patient in the ſame poſture wherein he was when he received his hurt; or elſe for that the ſtroke being made down-right, ſlipt aſide to the right or left hand, or elſe from below upwards, or from above downwards, and then he may expect that the wound is but little, and will be cured in a ſhort time, when it is like to be long in curing, or elſe mortal. Therefore from the firſt day it behooveth him to ſuſpend his judgment of the wound until the ninth, for in time the accidents will ſhew themſelves manifeſtly whether they be 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 venomous corruption.

How long a Surgeon muſt ſuſpend his judgment in ſome caſes.

General ſigns whereby we judge of Diſeaſes.

But generally the ſigns whereby we may judge of diſeaſes whether they be 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 Diſeaſe, or from the cauſe or effects thereof, or elſe from the ſimilitude, proportion, and compariſon of thoſe Diſeaſes, with the ſeaſon or preſent conſtitution of the times. Therefore if we are called to the cure of a green wound, whoſe nature and danger is no other but a ſimple ſolution of Continuity in the muſculous fleſh, we may preſently pronounce that wound to be of no danger, and that it will ſoon be cured. But if it have an Ulcer annexed unto it, that is, if it be ſanious, then we may ſay it will be more difficult and long in curing; and ſo we may pronounce of all Diſeaſes, taking a ſign of their eſſence and nature. But of the ſigns that are taken of the cauſes, let this be an example. A wound that is made with a ſharp-pointed and heavy weapon, as with an Halberd being ſtricken with great violence, muſt be accounted great, yea and alſo mortal, if the accidents be correſpondent.

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 bloud come forth at his eyes and noſtrils, if diſtraction follow with loſs of memory and ſenſe of feeling, we may ſay that all the hope of life remaineth in one ſmall ſign which is to be deduced from the affects of the wound. But by comparing it unto the ſeaſon that then is, and diſeaſes that then aſſault Mans Body, we may ſay, 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 battle of Saint *Denis*. For at that time, whether it were by reaſon of the fault of the Heavens, or Air, through the evil humours of mans body, 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, we ſee the Small-pox and Meazles 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 he lie ſenſleſs as it were aſleep, if he avoid his excrements unwittingly, if he be taken with giddineſs, if bloud come out at his Ears, Mouth, and Noſe, and if he vomit choler, you may underſtand that the ſkull is fractured, or pierced through, by the defect of his underſtanding and diſcourſe. You alſo may know when the ſkull is fractured, by the judgment of your external ſenſes, as if by feeling it with your finger you find 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 ſkull is cut croſs-wiſe, and ſo divided

Wounds deadly by the fault of the air.

Signs of a fractured ſkull.

vided there from it, it yield a base and unperfect sound like unto a pot-sherd that is broken, or rather like to an earthen Pitcher that hath a cleft, or rent therein.

But we may say, that death is at hand if his Reason and Understanding fail him, if he be speechless, if his sight forsake him, if he would tumble headlong out of his bed, being not at all able to remove the other parts of his body; if he have a continual Fever, if his tongue be black with drinefs, if the edges of the wound be black or drie, and cast forth no sanious matter, if they resemble the colour of salted flesh, if he have an Apoplexy, Phrensie, Convulsion or Palsie, with an involuntary excretion, or absolute suppression of the Urine and Excrements. You may know that a man hath his throat, that is, his weason and wind-pipe cut: First by the sight of his wound, and next by the abolishment of the function or office thereof both ways, for the Patient can neither speak nor swallow any meat or drink; and the parts that are cut asunder, divide themselves by retraction upwards or downwards one from another, whereof cometh sudden or present death. You may know that a Wound hath pierced into the breast or concavity of the body, if the air come forth at the wound making a certain whizzing noise, if the Patient breath with great difficulty, if he feel a great heavinefs or weight on or about the midriff, whereby it may be gathered that a great quantity of bloud lieth upon the place or midriff, and so causeth him to feel a weight or heavinefs, which by little and little, will be cast up by vomiting. But a little after a Fever cometh, and the breath is unsavoury and stinking, by reason that the putrifying bloud is turned into *sanies*: the Patient cannot lie but on his back, and he hath an often desire to vomit, but if he escape death, his wound will degenerate into a Fistula, and at length will consume him by little and little.

Signs of death by a wound on the head.

Signs that the throat is cut.

Signs that a wound hath pierced in the concavity of the chest.

We may know that the Lungs are wounded by the foaming and spumous bloud coming out both at the wound, and cast up by vomiting; he is vexed with a grievous shortnefs of breath, and with pain in his sides. We may perceive the Heart to be wounded by the abundance of bloud that cometh out of the wound, by the trembling of all the whole body, by the faint and small pulse, paleness of the face, cold sweat, with often swooning, coldnefs of the extreme parts, and sudden death.

Signs that the Lungs are wounded. That the heart is wounded.

When the Midriff (which the *Latins* call *Diaphragma*) is wounded, the Patient feeleth a great weight in that place, he raveth and talketh idlely, he is troubled with shortnefs of wind, a cough, and fit of grievous pain, and drawing of the intrails upwards. Wherefore when all these accidents appear, we may certainly pronounce that death is at hand.

The Midriff.

Death appeareth suddenly, by a wound of the hollow Vein, or the great Artery, by reason of the great and violent evacuation of bloud and spirits, whereby the functions of the Heart and Lungs are stopped and hindered.

The *Vena cava* and great Artery.

The Marrow of the back-bone being pierced, the Patient is assaulted with a Palsie or Convulsion very suddenly, and sense and motion faileth in the parts beneath it, the excrements of the bladder are either evacuated against the Patients will, or else are altogether stopped.

The spinal marrow.

When the Liver is wounded much bloud cometh out at the wound, and pricking pain disperseth it self even unto the sword-like gristle, which hath its situation at the lower end of the breast-bone called *Sternon*: the bloud that followeth from thence down into the intestines doth oft-times infer most malign accidents, yea, and sometimes death.

The Liver.

When the Stomach is wounded, the meat and drink come out at the wound, there followeth a vomiting of pure choler, then cometh sweating and coldnefs of the extreme parts, and therefore we ought to prognosticate death to follow such a wound.

The Stomach.

When the Milt or Spleen is wounded, black and gross bloud cometh out at the wound, the Patient will be very thirsty, with pain on the left side, and the bloud breaks forth into the belly, and there putrefying causeth most malign and grievous accidents, and often-times death to follow.

The Spleen.

When the guts are wounded, the whole body is griped and pained, the excrements come out at the wound, whereat also oft-times the guts break forth with great violence.

The Guts.

When the Reins or Kidnies are wounded the Patient will have great pain in making his Urin, and the bloud cometh out together therewith; the pain cometh down even unto the Groin, and Yard, and Testicles.

The Kidnies.

When the Bladder and Ureters are wounded, the pain goeth even unto the intrails; the parts all about and belonging to the Groin, are distended, the Urine is bloudy that is made, and the same also cometh oftentimes out of the wound.

The Bladder.

When the Womb is wounded the bloud cometh 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, Abscess, Fever, Convulsion, and oftentimes a Gangrene or Mortification of the part, whereof cometh death, unless it be speedily prevented.

The Nerves.

Having declared the signs and tokens of wounded parts, it now remaineth that we set down other signs of certain kinds 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 Nurse either through drunkennefs or negligence, lies upon the Infant lying in bed with her, and so stifles and smothers it to death: if your judgment be required, whether the Infant died through the default or negligence of the Nurse, or through some violent or sudden disease that lay hidden and lurking in the body thereof, you shall find 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 he were not froward or crying; if his mouth and nostrils, now being dead, be moistned or bedewed with a certain foam; if his face be not pale, but of a violet or purple colour; if when the body is opened the Lungs be found swollen and puffed up, as it were with a certain vaporous foam, and all other intrails sound; it is a token that the Infant was stifled, smothered or strangled by some outward violence.

If the Body or dead Corps of a man be found lying in a Field, or Houſe alone, and you be called by a Magiſtrate to deliver your opinion, whether the man were ſlain by Lightning or ſome other violent death; you may by the following ſigns find out the certainty hereof.

Signs of ſuch as are ſlain by Lightning.

For every body that is blaſted or ſtricken with lightning, doth caſt forth or breath out an unwholſome, ſtinking or ſulphureous ſmell, ſo that the Birds and Fowls of the air, or Dogs will not once touch it, much leſs prey or feed upon it: the part that was ſtricken often times found, and without a wound; but if you ſearch it well, you ſhall find the bones under the skin to be bruiſed, broken or ſhivered in pieces.

Lib. 2. cap. 54.

But if the Lightning hath pierced into the body, with making a wound therein (according to the judgment of *Pliny*) the wounded part is far colder than all the reſt of the body. For lightning driveth the moſt thin and fiery air before it, and ſtriketh it into the body with great violence, by the force whereof the heat that was in the part is ſoon diſperſed, waſted, and conſumed. Lightning doth always leave ſome impreſſion or ſign of ſome Fire either by uſtion or blackneſs: for no Lightning is without Fire.

Moreover whereas all other living Creatures when they are ſtricken with Lightning, fall on the contrary ſide, onely man falleth on the affected ſide, if he be not turned with violence toward the coaſt or region from whence the lightning came.

If a man be ſtricken with Lightning while he is aſleep, he will be found with eyes open; contrariwiſe, if he be ſtricken while he is awake, his eyes will be cloſed, as *Pliny* writeth. *Philip Commines* writeth that thoſe Bodies that are ſtricken with lightning, are not ſubject to corruption as others are.

Therefore in ancient time it was their cuſtom neither to burn nor bury them; for the brimſtone which the Lightning bringeth with it, was unto them in ſtead of Salt, for that by the drineſs and fiery heat thereof it did preſerve them from putrefaction.

Signs of wounds given to a living or dead man.

Alſo it may be inquired in judgment, Whether any that is dead and wounded, received theſe wounds alive or dead. Truly the wounds that are made of a living man, if he die of them, after his death will appear red and bloudy, with the ſides or edges ſwollen, or pale round about: contrariwiſe, thoſe that are made in a dead man, will be neither red, bloudy, ſwollen nor puffed up. For all the faculties and functions of life in the body do ceaſe and fall together by death; ſo that thenceforth no ſpirits nor bloud can be ſent, or flow into the wounded place. Therefore by theſe ſigns which ſhall appear, it may be declared that he was wounded dead or alive.

Signs whether one be hanged alive or dead.

The like queſtion may come in judgment when a man is found hanged, whether he were dead or alive. Therefore if he were hanged alive, the impreſſion or print of the rope will appear red, pale, or black, and the skin round about it will be 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 moved out of his place. Alſo the arms and legs will be pale by reaſon of the violent and ſudden ſuffocation of the ſpirits: moreover there will be a foam about his mouth, and a foamy and filthy matter hanging out of his noſtrils, being 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 he be hanged dead, none of theſe ſigns appear: for neither the print of the rope appears red or pale, but of the ſame colour as the other parts of the body are, becauſe in dead men the bloud and ſpirits do not flow to the grieved parts.

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 belly of him that was thrown in alive will be ſwollen and puffed up by reaſon of the water that is contained therein; certain clammy excrements come out at his mouth and noſtrils, the ends of his fingers will be worn and excoriated, becauſe that he died ſtriving and digging or ſcraping in the ſand or bottom of the River, ſeeking ſomewhat whereon he might take hold to ſave himſelf from drowning. Contrariwiſe, if he be thrown into the Waters, being dead before, his belly will not be ſwollen, becauſe that in a dead man all the paſſages and conduits of the body do fall togeter, and are ſtopped and cloſed, and for that a dead man breaths not, there appeareth no foam nor filthy matter about his mouth and noſe, and much leſs can the tops of his fingers be worn and excoriated, for when a man is already dead, he cannot ſtrive againſt death.

But as concerning the bodies of thoſe that are drowned, thoſe that ſwim on the upper part of the Water being ſwollen or puffed up, they are not ſo by reaſon of the water that is contained in the belly, but by reaſon of a certain vapour, into which a great portion of the humors of the body are converted by the efficacy of the putrefying 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 come to thoſe that are ſuffocated and ſtifled or ſmothered with the vapour of kindled or burning Charcoals, and how you may fore-tell the cauſes thereof by the hiſtory following. In the year of our Lord God 1575. the tenth day of *May*, my ſelf with *Robert Gleanline* Doctor of Phyſick, was ſent for by Mr. *Hamel*, an Advocate of the Court of *Parliament* at *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 Family ſuppoſed them dead, becauſe they could not perceive or feel their Arteries to beat, all the extreme parts of their bodies were cold, they could neither ſpeak nor move, their faces were pale and wan, neither could they be raiſed up with any violent beating or plucking by the hair. Therefore all men accounted them dead, and the queſtion was onely of what kind of death they died, for their Maſter ſuſpected that ſome body had ſtrangled them; others thought that each of them had ſtopped one anothers wind with their hands: and others judged that they were taken with a ſudden Apoplexy. But I preſently

presently enquired, whether there had been any fire made with Coals in the house lately? whereunto their Master giving ear, sought about all the corners of the Chamber, (for the Chamber was very little and close) and at last found an earthen pan with Charcoal half-burned: which when we once saw, we all affirmed with one voice, that it was the cause of all this misfortune, and that it was the malign fume and venomous vapour 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 perceive that there was some life remaining by the heat and pulsation that I felt, though it were very little, wherefore we thought it convenient to augment and increase it. Therefore first of all artificially opened their mouths, which were very fast closed, and sticking obstinately together; and thereinto both with a spoon and also with a silver pipe, we put *Aqua vitæ* often distilled with dissolved *Hiera* and Triacle; when we had injected these Medicins often into their mouths, they began to move and to stretch themselves, and to cast up and expel many viscous excremental and filthy humours at their mouths and nostrils, and their Lungs seemed to be hot, as it were in their throats.

Therefore then we gave them vomitories of a great quantity 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 vomitory Medicin and concussion of the stomach, they might be constrained to vomit. Neither did our purpose fail us, for presently they voided clammy, yellow and spumous phlegm and bloud.

But we not being contented with all this, blowed up into their nostrils, out of a Goose-quill, the powder of *Euphorbium*, that the expulsive faculty of the brain might be stirred up to the expulsion of that which oppressed it; therefore presently the brain being shaken, or moved with sneezing, and instimulated thereunto by rubbing the Chymical oil of Mints on the Palate and on the Cheeks, they expelled much viscous and clammy matter at their nostrils.

Then we used Frictions to their arms, leggs, and back-bones, and ministred sharp Clysters, by whose efficacy the belly being abundantly loosened, they began presently to speak, and to take things that were ministred unto them of their own accord, and so came to themselves again.

In the doing of all these things, *James Guillemeau* Surgeon to the King at *Paris*, and *John* of St. *Germans* the Apothecary, did much help and further us.

In the Afternoon that the matter being well begun might have good success, *John Hanry* and *Lewis Thibaut*, both most learned Physicians, were sent for unto us, with whom we might consult on other things that were to be done. They highly commended all things that we had done already, thought it very convenient that Cordials should be ministred unto them, which by ingendering of laudable humours, might not onely generate new spirits, but also attenuate and putrefie those that were cloudy in their bodies. The rest of our consultation was spent in the inquiry of the cause of so dire a mischance. For they said it was no new or strange thing, that men may be smothered with the fume and cloudy vapour of burning Coals.

For we read in the Works of *Fulgosius*, *Volaterranus*, and *Egnatius*, that as the Emperour *Jovinian* travelled in Winter time towards *Rome*, he being weary in his journey, rested at a Village called *Didastanes*, which divideth *Bithynia* from *Galatia*, where he lay in a Chamber that was newly made, and plastred with Lime, wherein they burned many Coals, for to drie the Work or Plastering, that was but as yet green on the Walls or Roofs of the Chamber. Now he died the very same night being smothered or strangled with the deadly and poisonous vapour of the burned Charcoal, in the midst of the night; this happened to him in the eighth moneth of his Reign, the thirteenth year of his Age, and on the twentieth day of *August*. But what need we to amplifie this matter by the ancient Histories, seeing that not many years since three servants died in the house of *John Bigine* Goldsmith, who dwelt at the turning of the Bridge at the Change, by reason of a fire made with Coals in a close Chamber without any Chimney where they lay: and as concerning the causes, these were alledged; Many were of Opinion that it happened by the default of the vapour proceeding from the burned Coals, which being in a place void of all Air or Wind, infers such like accidents as the vapour or Must of new Wine doth, that is to say, pain and giddiness of the head. For both these kinds of Vapour, besides that they are crude, like unto those things whereof they come, can also very suddenly obstruct the original of the Nerves, and so cause a Convulsion, by reason of the grosness of their substance. *Lib. 9. cap. 12. lib. 23. An History.*

For so *Hippocrates* writing of those accidents that happen by the vapour of new Wine, speaketh; If any man being drunken, do suddenly become speechless and hath a convulsion, he dieth, unless he have a Fever therewithal; or if he recover not his speech again when his drunkenness is over. *Sect. 5. Aph. 51.*

Even on the same manner the vapour of the Coals assaulting the Brain, caused them to be speechless, unmoveable, and void of all sense, and had died shortly, unless by ministring and applying warm Medicins into the mouth and to the nostrils, the grosness of the vapour had been attenuated, and the expulsive faculty moved or provoked to expel all those things that were noisom: and also although at the first sight the Lungs appeared to be grieved more then all the other parts, by reason that they drew the malign vapour into the body, yet when you consider them well, it will manifestly appear that they are not grieved, unless it be by the sympathy or affinity that they have with the brain when it is very grievously afflicted.

The proof hereof is, because presently after there followeth an intereception or defect of the Voice, Sense and Motion: which accidents could not be, unless the beginning or original of the Nerves were intercepted or letted from performing its function, being burthened by some matter contrary to Nature.

And even as those that have an Apoplexy do not die but for want of respiration, yet without any offence of the Lungs, even so these two young mens deaths were at hand, by reason that their respiration or breathing was in a manner altogether intercepted, not through any default of the Lungs, The occasion of the death of such as have the Apoplexy.

Lungs, but of the Brain and Nerves distributing sense and motion to the whole body 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 be the occasion that sufficient matter could not be afforded for to preserve and feed the animal spirit. Which was the cause that those young men were in danger of death, for want of respiration, without which there can be no life.

For the heart being in such a case, cannot deliver it self from the fuliginous vapours that encompass it, by reason that the Lungs are obstructed by the grosness of the vapour of the Coals, whereby inspiration cannot well be made, for it is made by the compassing air drawn into our bodies: but the air that compasseth us doth that which Nature endeavoureth to do by inspiration, for it moderateth the heat of the heart, and therefore it ought to be endued with four qualities. The first is, that the quantity that is drawn into the body be sufficient. The second is, that it be cold, or temperate in quality. The third is, that it be of a thin and mean consistence. The fourth is, that it be of a gentle benign substance.

But these four conditions were wanting in the air which those two young men drew into their bodies being in a close Chamber.

Conditions of the air good to breath in.

For first it was little in quantity, by reason that small quantity that was contained in that little close Chamber, was partly consumed by the fire of coals; no otherwise than the air that is contained in a Cupping-glass is consumed in a moment by the flame so soon as it is kindled.

Furthermore it was neither cold nor temperate, but as it were inflamed with the burning fire of Coals.

Thirdly, It was more gross in consistence than it should be, by reason of the admixtion of the grosser vapour of the coals: for the Nature of the air is so that it may be soon altered, and will very quickly receive the forms and impressions of those substances that are about it.

Lastly, it was noisom and hurtful in substance, and altogether offensive to the airy substance of our bodies. For Charcoals are made of green wood burnt in pits under ground, and then extinguished 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 grosness of the vapours 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 body is so great, that they cannot long abide sound and perfect without their mutual help by reason of the loving and friendly sympathy and affinity that is between all the parts of the body one with another.

Wherefore the ventricles of the Brain, the passages of the Lungs, and the sleepy Arteries being stopped, the vital spirit was prohibited from entering into the Brain, and consequently the animal spirit retained and kept in, so that it could not come or disperse it self through the whole body, whence happeneth the defect of two of the faculties necessary for life.

Of the signs of Virginity.

It many times happeneth, and is a question too frequently handled, concerning Womens Maidenheads; whereof the judgment is very difficult. Yet some ancient Women and Midwives will brag that they assuredly know it by certain and infallible signs. For (say 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 be put in any thing deep; which membrane is broken when first they have carnal copulation, as may afterwards be perceived by the free entrance of the finger. Besides, such as are deflowered have the neck of their womb more large and wide; as on the contrary, it is more contract, 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 be in one of a thousand, from the first conformation. Now the neck of the Womb will be more open or strait, according to the bigness and age of the party. For all the parts of the body have a certain mutual proportion and commensuration in a well made body.

Lib. de error. popul.

Joubertus hath written, that at *Lectoure* in *Gascony*, a Woman was delivered of a child in the nineth year of her age, and that she is yet alive, and called *Joan de Parie*, wife to *Videau Beche* the Receiver of the Amercements of the King of *Navarre*: which is a most evident argument, that there are some Women more able to accompany with a man at nine years old, than many other at fifteen, by reason of the ample capacity of their womb, and the neck thereof: besides also, this passage is enlarged in many by some accident, as by thrusting their own fingers more strong thereinto by reason of some itching, or by the putting up of a Nodule or Pessary, of the bigness of a mans Yard, for to bring down the Course. Neither to have milk in their brests is any certain sign of lost Virginity. For *Hippocrates* thus writes: But if a Woman which is neither with child, nor hath had one, have milk in her brests, then her Courses have failed her.

Aph. 39. sect. 5.

Moreover, *Aristotle* reports that there be men who have such plenty of milk in their brests, that it may be sucked or milked out,

Lib. 4. de Hist. animal. c. 20. Lib. 12. de subtilitate.

Cardan writes, that he saw at *Venice* one *Anthony Bussey*, some 30 years old, who had milk in his brest in such plenty, as sufficient to suckle a child, so that it did not onely drop but spring out with violence like to a womans milk. Wherefore let Magistrates beware, lest thus admonished, they too rashly assent to the reports of Women. Let Physicians and Chirurgeons have a care lest they do too impudently bring Magistrates into an errour, which will not redound so much to the Judges disgrace as to theirs.

But if any desire to know whether one be poisoned, let him search for the symptoms and signs in the fore-going and particular Treatise of Poisons. But that this doctrine of making Reports may be the eaher, I think it fit to give presidents, in imitation whereof the young Chirurgeon may frame others.

others. The firſt preſident ſhall be of death to enſue; a ſecond of a doubtful judgment of life and death; the third of an impotency of a member; the fourth of the hurting of many members.

I *A.P.* Chirurgeon of *Paris*, this twentieth day of *May*, by the command of the Council, entered into the houſe of one *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 pulſe was weak, he was troubled with raving, convulſion, cold ſweat, and his appetite was dejected. Whereby may be gathered that certain and ſpeedy death is at hand. In witneſs whereof I have ſigned this Report with my own hand. A certificate of death.

By the Coroners command I have viſited *Peter Lucey*, whom I found ſick in bed, being wounded with a Halbard on his right thigh. Now the wound was of the bredth of three fingers, and ſo deep that it pierces quite through his thigh with the cutting alſo of the Vein and Artery, whence inſued much effuſion of bloud, which hath exceedingly weakned him, and cauſed him to ſwound often; now all his thigh is ſwollen, livid, and gives occaſion to fear worſe ſymptoms, which is the cauſe that the health and ſafety of the party is to be doubted of. Another in a doubtful caſe.

By the Juſtices command I entered into the houſe of one *James Bertey*, to viſit his own brother; I found him wounded in his right arm, with a wound of ſome four fingers bigneſs, with the cutting of the tendons bending the leg, and of the Veins, Arteries, and Nerves. Wherefore I affirm that he is in danger of his life, by reaſon of the malign ſymptoms that uſually happen upon ſuch wounds, ſuch as are great pain, a Fever, Inflammation, Abſceſs, Convulſion, Gangrene, and the like. Wherefore he ſtands in need of provident and careful dreſſing, by benefit whereof if he eſcape death, without doubt he will continue lame during the remainder of his life, by reaſon of the impotency of the wounded part. And this I affirm under my hand. In the loſs of a member.

We the Surgeons of *Paris*, by the command of the Senate, this twentieth day of *March*, have viſited Maſter *Lewis Vertoman*, whom we 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 penetrates even to the ſecond table, ſo that we 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 midſt of his noſe, wherefore we ſtitched it with four ſtitches. The third is on the midſt of his belly, of the bigneſs of two fingers, but ſo deep that it aſcends into the capacity of the belly, ſo that we were forced to cut away portion of the Kall coming out thereat, to the bigneſs of a Walnut, becauſe having loſt its natural colour, 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, Nerves, and part of the bones of that part; whence it is that he will be lame of that hand, howſoever carefully and diligently healed. Another in the hurts of divers parts.

Now becauſe by hurting the ſpinal marrow men become lame ſometimes of a leg, it is fit you know that the ſpinal marrow deſcends from the brain like a Rivulet for the diſtribution of the Nerves, which might diſtribute ſenſe and motion to all the parts under the head; wherefore if by hurting the ſpinal marrow the Patients arms or hands are reſolved or numb, or wholly without ſenſe, it is a ſign theſe nerves are hurt which come 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 Patients knowledge, or elſe are totally ſuppreſt, it is a ſign that the ſinews which proceed from the *Vertebræ* of the loins and holy-bone are hurt, or in fault; ſo that the animal faculty beſtowing ſenſe and motion upon the whole body, and the benefit of opening and ſhutting of the ſphincter muſcle of the bladder and fundament, cannot ſhew it ſelf in theſe parts, by which means ſudden death happens, eſpecially if there be difficulty of breathing therewith.

Being to make Report of a Child killed by the Mother, have a care that you make a diſcreet Report, whether the child were perfect in all the parts and members thereof, that the Judge may equally puniſh the author thereof. For he meriteth far greater puniſhment, who hath killed a child perfectly ſhaped and made in all the members; that is, he which hath killed a live child, than he which hath killed an *Embryon*, that is, a certain concretion of the ſpermatick body. For *Moſes* puniſheth the former with death, as that he ſhould give life for life, but the other with a pecuniary mulct. But I judg it fit to exemplifie this report by a preſident. A caution in making Report of a Woman with child being killed.

I *A.P.* By the Judges command viſited Miſtriſs *Margaret Ulmargy*, whom I found ſick in bed, having a ſtrong Fever upon her, with a convulſion and efflux of bloud out of her womb, by reaſon of a wound in her lower belly, below her navel on the right ſide, penetrating into the capacity of her belly, and the wound therein; whence it hath come to paſs, that ſhe was delivered before her time of a male child, perfect in all his members, but dead, being killed by the ſame wound, piercing through his ſcull into the marrow of the brain. Which in a ſhort time will be the death of the Mother alſo. In teſtimony 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 Treatiſe of Reports; but a better thought came into my head, which was, to bring Man, whoſe cure I had undertaken, from his Infancy to his End, and even to his Grave; ſo that nothing might be here defective which the Surgeon might by his Profeſſion perform about Mans body 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 very *Scythians*, who

The care of the *Scythians* in the embalming their dead.

The like care of the *Ethiopians.*

Lib.3. Of the *Egyptians.*

The reason of building of the *Egyptians* Pyramids.

Lib. 2.

John 19.39.

Gen 50.2.

The manner of embalming for a long continuance.

How to embalm bodies when as we want spices.

have seemed to exceed other Nations in barbarousness and inhumanity, have done this; for (according to *Herodotus*) the *Scythians* bury not the corps of their King, before that being imbowelled and stuffed full of beaten Cypress, Frankincense, the Seeds of Parsley, and Anise, he be also wrapped in Cere-cloths. The like care hath also possessed the minds of the *Ethiopians*; for having disburthened the corps of their friends of their entrails and flesh, they plastered them over, and then they thus rough-cast them, they painted them over with colours so to express the dead to the life; they inclosed them thus adorned in a hollow pillar of Glass, that thus inclosed they may be seen and yet not annoy the Spectators with their smell. Then were they kept for 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 City, and placed them about the Walls each in his proper Vault, as *Herodotus* affirms. But this pious care of the dead did far otherwise affect the *Egyptians* than it did other Nations: For they were so studious to preserve the memory of their Ancestors, that they embalmed their whole body with aromatick ointments, and set them in translucent Urns, or glass Cells, in the more eminent and honoured part of their houses, that so they might have them daily in their sight, and might be as monuments and inciters to stir up them to imitate their Fathers and Grandsires Vertues. Besides also the bodies thus embalmed with aromatick and balsamick ointments, were in stead of a most sure pawn, so that if any *Egyptian* had need of a great sum of money, they might easily procure it of such as knew them and their neighbours, by pawning the dead body of some of their dead Parents. For by this means the Creditor was certain, that he which pawned it, would sooner lose his life than break his promise. But if all things so unhappily succeeded with any, so that through poverty he could not fetch home his pawn again, but was forced to forego it, he was so infamous amongst all men, during the rest of his life, as one banished, or forlorn; and losing his freedom he shall become a servant, yea, scorned and reviled of all men, he should be accounted unworthy to enjoy the light and society of men. And certainly the *Egyptians* understanding the life which we here lead, to be of short continuance, comparison being made with that which we are to live after separation of the soul from the body, they were more negligent in building their houses they dwelt in, but in rearing the Pyramids which should serve them in stead of Sepulchres, they were so beyond reason sumptuous and magnificent, that for the building one of these Edifices so renowned over all the World, which King *Cheopes* begun, a hundred thousand men were every three moneths, for twenty years space there kept at work: It was five furlongs, and being square, each side was 800 foot long; and so much in height. Almost all the pieces of marble went to the building thereof, were thirty foot long, engraven and carved with various workmanship, as *Herodotus* reports. But before the bodies were committed to these magnificent Sepulchres, they were carried to the Salters and Embalmers, who for that purpose had allowance 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 days; which being expired, they washed them, being taken thence, and all the filth being taken off, they wrapped them in Cotten cloths, glued together with a certain gum; then their Kinsmen placed them thus ordered in a woodden 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 Countrymen 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 ancient 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 bury the body of *Jesus Christ* our Saviour, for a sign and argument of the renovation and future integrity 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 that they should embalm the dead body of his Father with Spices.

But the body which is to be embalmed with Spices for very long continuance, must first of all be imbowelled, keeping the heart apart, that it may be embalmed and kept as the Kinsfolks shall think fit. Also the brain, the scull being divided with a Saw, shall be taken out. Then shall you make deep incisions along the arm, thighs, legs, back, loins and buttocks, especially where the greater Veins and Arteries run, first that by this means the bloud may be pressed forth: which otherwise would putrefie and give occasion and beginning to putrefaction to the rest of the body; and then that there may be space to put in the aromatick powders; the whole body shall be washed over with a Sponge dipped in *Aqua vitæ* and strong Vinegar, wherein shall be boiled Wormwood, Aloes, Coloquintida, common Salt and Alum. Then these incisions, and all the passages and open places of the body, and the three bellies shall be stuffed with the following Spices grosly powdered. *℞ Pulv. rosar. chamæm. melil. balsami, menthæ, anethi, salviæ, lavend. rorismar. marjoran. thymi, absynthii, cyperi, calami aromat. gentianæ, ireos florent. asse odoratæ, caryophyll. nucis moschat. cinnamomi, styracis, calamitæ. benjoini, myrrhæ, aloes, santal. omnium quod sufficit.* Let the incisions be sewed up, and the open spaces that nothing fall out; then forthwith let the whole body be anointed with Turpentine dissolved with Oil of Roses and Camomil, adding, if you shall think it fit, some Chymical Oils of Spices, and then let it be again strewed over with the fore-mentioned Powder; then wrap it in a linen cloth, and then in Cere-cloths.

Lastly, let it be put in a Coffin of Lead sure soldered and filled up with drie sweet herbs. But if there be no plenty of the fore-mentioned Spices, as it usually happens in besieged Towns, the Surgeon shall be contented with the powder of quenched lime, common ashes made of Oak-wood.

For thus the body being over and above washed in strong Vinegar or Lye, shall be kept a long time if so be that a great dissolving heat do not bear sway, or if it be not put in a hot and moist place.

And

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 days, in which they are kept to be shewed to the people after their embalming, do cast forth so grievous a scent, that none can indure it; so that they are forced to be put in a leaden Coffin. For the air which encompasseth them groweth so hot by reason of the multitude of people flowing to the spectacle, and the burning of lights night and day, that the small portion of the native heat which remaineth being dissipated, they easily putrefie, especially when as they are not first moistened and macerated in the liquor of aromatick things, as the Egyptians anciently used to do, steeping them in brine for 70 days, as I formerly told you out of *Herodotus*. I put in mind hereby, use, that so the embalming may become the more durable, to steep the bodies (being imbowelled, 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 Aloes, Rue, Wormwood, and Coloquintida; and there keep them for twenty days, pouring thereinto eleven or twelve pints 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 body of one that was hanged, which I begged of the Sheriff, embalmed after this manner; which remains found for more than 25 years, 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 distinctions sake, that so I may view them with mine eyes, and handle them with my hands as often as I please, that by renewing my memory I may work more certainly and surely, when as I have any more curious operation to be performed) the left side remain whole, and the Lungs, Heart, *Diaphragma*, Stomach, Splene, Kidnies, Beard, Hairs, yea and the Nails, which being pared, I have often observed to grow again to their form and bigness.

Why the bodies of our Princes, how well soever embalmed, corrupt in a few days.

And let this be the bound of this our immense labour, and by Gods favour, our rest; to whom Almighty, All-powerful, Immortal and Invisible, be ascribed all honour and glory for ever and ever. *Amen.*

Labor improbus omnia vincit.

The End of the Treatise of Reports, and Embalming the Dead.

BOOK XXIX.

The Apology and Treatise, containing the Voyages made into divers places, by Ambrose Parey *of* Laval *in* Maine, *Counsellor and Chief Chirurgeon to the King.*

TRuly I had not put my hand to the Pen, to write on such a thing, were it not that some have impudently injured, taxed, and more through particular hatred, disgraced me, than 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:

Of what the Adversary accuseth the Author.

Male igitur & nimium arroganter inconsultus & temerarius quidam, vasorum ustionem post emortui membri resectionem à veteribus omnibus plurimum commendatam & semper probatam damnare ausus est, novum quendam deligandi vasa modum, contra veteres omnes medicos, sine ratione, experientiâ & judicio docere cupiens, nec animadvertit majora multo pericula ex ipsa vasorum deligatione quam acu partem sanam profunde transfigendo administrari vult, imminere quam ex ipsa ustione. Nam si acu nervosam aliquam partem, vel nervum ipsum pupugerit, dum ità novo & insolitato modo venam absurde conatur constringere, nova inflammatio necessario consequetur, à qua Convulso & à convulsione cita mors. Quorum symptomatum metu Galenus non ante transversa vulnera suere audebat (quod tamen minus erat periculosum) quam musculorum aponeuroses denudasset. Adde quod forcipes quibus post sectionem iterum carnem dilacerat, cum retracta versus originem vasa se posse extrahere somniat, non minorem adferant dolorem quam ignita ferramenta admota. Quod si quis laniatum expertus incolumis evaserit, is Deo optimo maximo, cujus beneficentia crudelitate ista & carnificina 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 always approved by the Ancients; desiring to shew and teach us without Reason, Judgment, and Experience, a new way to tie the Vessels, against the opinion of the ancient Physicians, taking no heed, nor being well advised, that there happens far greater perils and accidents, through this new way of tying the Vessels (which he will have to be made with a Needle, piercing deeply the found part) then by the burning and ustion of the said Vessels; for if the Needle shall prick any nervous part, yea the Nerve it self, when he shall by this new and unaccustomed way, absurdly constrain the vein by binding it, there must necessarily follow a new Inflammation; from the Inflammation a Convulsion, from a Convulsion, Death: for fear of which accidents, *Galen* never durst stitch transversal wounds, (which notwithstanding were less dangerous) before he had discovered the Aponeuroses of the Muscles. Moreover the Pincers with which, after the section, the flesh is again dilacerated, while he thinks to draw the Vessels out which are drawn in toward their original, bring no less pain than the cautering irons do. And

The words of the Adversity.

if any one having experimented this new manner of cruelty have escaped danger, he ought to render thanks to Almighty God for ever, through whose goodness he hath been freed from such tyranny, feeling rather his executioner than his methodical Chirurgeon.

The Authors answer.

O what sweet words are here, for one who is said to be a wise and learned Doctor? he remembers not that his white beard admonisheth him, not to speak any thing unworthy of his age, and that he ought to put off and drive out of him all envy and rancour conceived against his neighbour. So now I will prove by Authority, Reason and Experience, that the said Veins and Arteries ought to be tied.

Authorities.

AS for Authorities, I will come to that of that worthy man *Hippocrates*, who wills and commands the cure of Fistulaes in the Fundament by ligature, as well to consume the callosity, as to avoid hæmorrhagy. In the Book of Fistulaes of the Fundament, Chap. 3. Book 5. leaf 4.

Galen, Treatise 2. chap. 17. in his Method, speaking of a Flux of Bloud made by an outward cause, of whom see here the words, *It is* (saith he) *most sure to tie the root of the Vessel, which I understand to be that which is most near to the Liver or the Heart.*

Avicen, Treatise 3. Doct. 1. chap. 3. commands to tie the Vein and the Artery, after it is discovered towards his original.

Guido of *Cauliac*, speaking of the wounds of the Veins and Arteries, injoineth the Chirurgeon to make the ligature in the Vessel.

Master *Hollier* in the 3. Book, chap. 4. of the matter of Chirurgery, speaking of a flux of bloud, commands expresly to tie the vessels.

Calmetheus in 12. chap. of the wounds in the Veins and Arteries, tells a most sure way to stay 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 bloud happening to wounds, as a remedy most easie and most sure.

Vesalius in his Chirurgery, Chap. 4. Book 3. willeth that the Vessel be tied in a flux of bloud.

John de Vigo, Book 1. Treatise 1. tteating of Hæmorrhagy in bleeding wounds, commands to tie the Vein and the Artery.

Tegaultius, Chap. 12. Book 2. treating of the means to stay the flux of bloud, commands to pinch the Vein or Artery with a Crow or Parrots bill, then to tie it with a very strong thred.

Peter of *Argillata* of *Bullonge*, Treatise 4. Chap. 11. Book 1. discourfing of a flux of bloud, and the means to stop it, giveth a fourth way 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 Chapter of the Book of *Paul*, makes mention of a method to stay a flux of bloud by the ligature of the Vessels.

D' Alechamp commands to tie the Veins and Arteries.

See then (my little good man) the Authorities which command you to tie the Vessels. As for the Reasons, I will debate of them.

The Hæmorrhagy (say you) is not so much to be feared in the section of the Kall, 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 bloud be stopped by the ligature of the Vessels. In the Book 2. Chap. of Angealogy, leaf 176. you command the same in the Book of Stitches, Chap. 1. speaking of the stitch with the amputation and section of the Kall, changed by the outward air; see here your own words: After that must be considered concerning the Kall: for if there be any part corrupted, putrefied, withered, or blackish: first having tied, for fear of a flux of bloud, you do not bid afterwards to have it cauterised. But to say the truth, you have your eyes 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, than Choler and Anger. Moreover when one comes to cauterize and dismember the parts, oftentimes when the Eschar comes to fall off, there happens a new flux of bloud: As I have seen divers times, not having been yet 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 Ancients, you ought not thus to tread it under your feet, and speak unluckily of one, who all his life hath preferred the profit of the Common-wealth before his own particular. It is not more than reasonable to be found upon the saying of *Hippocrates*, in the Chapter of Burning, Book 2. Leaf 206. upon whose Authority you serve 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 favours not of a Christian, to fall to burning at the first dash, without staying for any more gentle remedies. As you your self write in the first Book, leaf 5. speaking of the conditions required in a Chirurgeon to cure well; which passages you borrow from some other place: for that which may be done gently without fire, is much more commended than otherwise. Is it not a thing which all Schools hold as a Maxim, that we must always begin with most easie remedies, which if they be not sufficient, we must then come to extreme, following the doctrine of *Hippocrates*? *Galen* commands in the place before alledged, to treat or dress the diseased quickly, safely, and with the least pain that is possible.

Galen in Book 4. of the *Meth.* and in the Book of Art of *Hippocrates*, Aph. 2. Book 1. In the Book of *Arte Parva.*

Let us come to Reason.

NOw so it is, that one cannot apply hot irons but with extreme and vehement pain in a sensible part void of a Gangrene, which would be cause of a Convulsion, Fever, yea, oft-times of Death. Moreover it would be a long while afterwards before the poor Patient were cured, because that by the action of the fire there is made an eschar, which proceeds from the subject flesh, which being fallen, Nature must regenerate a new flesh in stead of that which hath been burned; as also the bone remains discovered and bare; and by this means, for the most part there remains

Of what the Eschar is made.

mains an ulcer incurable. Moreover there is yet another accident. It happeneth that oftentimes the cruſt being fallen off, the fleſh not being well renewed, the bloud iſſueth out as it did before. But when they ſhall be tied, the ligature falls not off until the firſt fleſh have very well covered them again: which is proved by *Galen* in the fifth Book of his *Meth.* ſaying, that Eſcharotick Medicins which cauſe a Cruſt or Eſchar, whenſoever they fall off, leave the part more bare than the natural habit requires. For the generation of a cruſt proceeds from the parts ſubject, and which are ſituate round about it, being alſo burned, as I may ſay: wherefore by how much the part is burnt, by ſo much it loſeth the natural heat. Then tell me when it is neceſſary to uſe eſcharotick Medicins, or cautering irons? 'Tis when the flux of bloud is cauſed by eroſion, or ſome gangrene or putrefaction. Now is it thus? in freſh bleeding wounds there is neither gangrene, nor putrefaction. Therefore, the cauteries ought not to be there applied. And when the Ancients commanded to apply hot irons to the mouths of the veſſels, it hath not been onely to ſtay the flux of bloud, but chiefly to correct the malignity, or gangrenous putrefaction which might ſpoil the neighbouring parts. And it muſt be 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 poſterity, ſuch a way of ſtopping a flux of bloud. But I writ it after I had ſeen it done, and did it very often with happy ſucceſs. See then what may happen through your inconſiderate counſel, without examining, or ſtanding upon the facility of tying the ſaid veſſels. For ſee, here is your ſcope and propoſition, to tie the veſſels after amputation is a new remedy, ſay you, then it muſt not be uſed; it is an ill argument for a Doctor. Words of the Adverſary.

But as for that (ſay 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, becauſe the practice is to amputate the part above that which is mortified and corrupted; as *Celſus* writes and commands, to make the amputation upon the ſecond part, rather than to leave any whit of the corrupted. I would willingly ask you, if when a vein is cut tranſverſe, and that it is very much retracted towards the original, whether you would make no conſcience to burn till that you had found the orifice of the vein or artery; and if it be not more eaſie onely with a Crow-bill to pinch and draw the veſſel, and ſo tie it? In which you may openly ſhew your ignorance, and that you have your mind ſeized with much rancor and choler. We daily ſee the ligature of the veſſels practiſed with happy 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. Propoſitions of the Adverſary. In Book 5. ch. 26. and Book 7. ch. 33. In the chap. of Cutting, Book 2.

The 16. of *June* 1582. in the preſence of Mr. *John Liebaud* Doctor in the Faculty of Phyſick at *Paris*, *Claud Viard* ſworn Surgeon, Mr. *Mathurin Heron* Surgeon of Monſieur *de Souvray*, and my ſelf, *John Charbonel* Maſter Barber-Surgeon of *Paris*, well underſtanding the Theorick and Practick of Surgery, did with good dexterity 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*, *Cuboides*, great and little *ſcoil*, and through all the nervous parts, through which ſhe felt extreme and intolerable pains night and day: ſhe is called *Mary* of *Hoſtel*, aged 28 years or thereabouts, wife of *Peter Herve* Eſquire of the Kitchin to the Lady *Ducheſs* of *Uzez*, dwelling in the ſtreet of *Verbois*, on the other ſide St. *Martin* in the Fields, dwelling at the ſign of the St. *Johns* head; where the ſaid *Charbonel* cut off the ſaid leg the bredth of four large fingers below the Knee, and after that he had inciſed the fleſh, and ſawed the bone, he griped the vein with a Crow-bill, then the artery, then tied them; from whence I proteſt to God (which the company that were there can witneſs) that in all the operation that was ſuddenly done, there was not ſpilt one Porrenger of bloud; and I bid the ſaid *Charbonel* to let it bleed more, following the precept of *Hippocrates*, that it is good in all wounds and inveterate ulcers, to let the bloud run; by this means the part is leſs ſubject to inflammation. The ſaid *Charbonel* continued the dreſſing of her, who was cured in two moneths, without any flux of bloud happening unto her, or other ill accident; and ſhe went to ſee you at your lodging being perfectly cured. Experiences. A notable Hiſtory. The operation of *Charbonel*. In the 7. Cent. of the Book of Ulcers.

Another Hiſtory of late memory, of a Singing-man of our Ladies Church, named Mr. *Colt*, who broke both the bones of his leg which were cruſhed in divers pieces, inſomuch that there was no hope of cure, to withſtand a Gangrene and mortification, and by conſequence death. Monſieur *Helin* Doctor Regent in the Faculty of Phyſick, a man of honour and good knowledge, *Claud Viard* and *Simon Peter*, ſworn Surgeons of *Paris*, men well exerciſed in Surgery; and *Balthazar* of *Leſevre*, and *Leonard de Leſebenal*, Maſter Barber-Surgeons, well experimented in the operations of Surgery, were all of opinion, to withſtand the accidents aforeſaid, to make entire amputation of the whole leg, a little above the broken and ſhivered bones and the torn nerves, veins, arteries; the operation was nimbly done by the ſaid *Viard*, and the bloud ſtanched by the ligature of the veſſels in the preſence of the ſaid *Helin*, and Mr. *Tonſard* great Vicar of our Ladies Church, and was continually dreſſed by the ſaid *Leſebenal*, and I went to ſee him otherwhiles: he was happily cured without the application of hot irons, and walketh luſtily with a wooden leg. Another Hiſtory. Operation done by *Viard*.

In the year 1583. the 10. day of *December*, *Touſſaint Poſſon* born at *Roſieville*, at this preſent dwelling at *Beauvais* near *Dourdan*, having his leg all ulcered, and all the bones cariez'd and rotten, prayed me for the honour of God to cut off his leg, by reaſon of the great pain, which he could no longer endure. After his body was prepared, I cauſed his leg to be cut off, four fingers below the *rotula* of his knee, by *Daniel Powlet* one of my ſervants, to teach him, and to embolden him in ſuch works; and there he readily tied the veſſels to ſtay the bleeding, without application of hot irons, in the preſence of *James Guilleman* ordinary Surgeon to the King, and *John Charbonel* Maſter Surgeon of *Paris*: and during the cure was viſited by Mr. *Laſſile* and Mr. *Courtin*, Doctors Regent in the Faculty of Medicin at *Paris*. The ſaid operation was made in the houſe of *John Gobel* Inn-keeper, dwelling at the ſign of the White Horſe in the Greve. I will not here forget to ſay, that Another Hiſtory.

Another History. the Lady Princeſs of *Montpenſier*, knowing that he was poor and in my hands, gave him money to pay for his Chamber and Diet, He was well cured, God be praiſed, and is returned home to his houſe with a woodden leg.

A Gangrene happening by an Anticedent cauſe. A Gangrene happened to half of the leg to one named *Nicolas Meſnager*, aged 76 years, dwelling in St. *Honores* ſtreet, at the ſign of the Basket, which happened to him through an inward cauſe, ſo that we were conſtrained to cut off his leg to ſave his life: and it was taken off by *Anthony Renaud*, Maſter Barber-Surgeon of *Paris*, the 16. day of *December* 1583. in the preſence of M. *Le Fort*, and M. *La Nave*, ſworn Surgeons of *Paris*; and the bloud was ſtanched by the Ligature of the Veſſels, and he is at this preſent cured and in health, walking with a woodden leg.

Another History. A Water-man at the Port of *Neſle*, dwelling near Monſieur *de Mas*, Poſt-maſter, named *John Bouſſereau*, in whoſe hands a Musket brake aſunder, which broke the bones of his hand, and rent and tore the other parts in ſuch ſort, that it was needful and neceſſary to make amputation of the hand two fingers above the wriſt: which was done by *James Guillemau*, then Surgeon in ordinary to the King, who dwelt at that time with me. The operation likewiſe being readily done, and the bloud ſtanched by the ligature of the veſſels, without burning irons, he is at this preſent living.

Operation done by *Guillman*.

Another History. Operation done by the Author. A Merchant Grocer dwelling in St. *Denis* ſtreet at the ſign of the great *Tournois*, named *the Judge*, who fell upon his head, where was made a wound near the temporal muſcle, where he had an artery opened, from whence iſſued forth bloud with great impetuoſity, inſomuch that common remedies would not ſerve the turn; I was called thither, where I found Mr. *Roſſe*, Mr. *Cointerot*, Mr. *Viard*, ſworn Surgeons of *Paris*, to ſtay bloud; where preſently I took a needle and thred and tied the artery, and it bled no more after that, and was quickly cured. Mr. *Roſſellet* can witneſs it, not long ſince Deacon of your Faculty, who was in the cure with us.

Another History. Another operation. A Serjeant of the Chaſtlet dwelling near St. *Andrew des Arts*, who had a ſtroke of a Sword upon the throat in the Clacks Meadow, which cut aſunder the jugular vein extern: as ſoon as he was hurt he put his handkerchief upon the wound, and came to look me at my houſe, and when he took away his handkerchief, the bloud leaped out with great impetuoſity: I ſuddenly tied the vein toward the root; he by this means was ſtanched and cured, thanks be to God. And if one had followed your manner of ſtanching bloud by cauteries, I leave it to be ſuppoſed whether he had been cured; I think he had been dead in the hands of the Operator. If I would recite all thoſe whoſe veſſels were tied to ſtay the bloud, which have been cured, I ſhould not have ended this long time; ſo that methinks there are Hiſtories enough recited to make you believe the bloud of veins and arteries is ſurely ſtanched without applying any outward cauteries.

Du Bartas.

He that doth ſtrive againſt Experience,
Deigns not to talk of any learned Science.

Book 6. c. 4. Book 2. c. 4. Book 3. c. 9. Sect. 7. NOw my little Maſter, ſeeing that you reproach me that I have not written all the operations of Surgery in my Works, which the Ancients write of, I ſhould be very ſorry for it: for then indeed might you juſtly call me *Carnifex*. I have left them becauſe they are too cruel, and am willing to follow the Moderns, who have moderated ſuch cruelty: 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 Authors, ſuch as follow, and ſuch as you have never practiſed nor ſeen.

The Firſt Operation.

In the ſecond Book of the Chapter of *Hypopatiſm*, Book 4. ch. laſt of the Meth. In the 4. ch. of the 16. Book of my Work. Book 6. c. 7. Book 2. c. 5. TO inveterate fluxions of the Eyes, and Meagrims, *Paulus Ægineta* as alſo *Albucaſis* command to make *Arteriotomy*; ſee here the words of the ſame *Ægineta*. You mark the arteries which are behind the Ears, then divide them in cutting to the very bone, and make a great inciſion, the bredth of two fingers, even till the artery be found, as you command to be done in your Book; but I holding the opinion of *Galen*, who commands to dreſs the diſeaſe quickly, ſafely, and with the leaſt pain that is poſſible; I teach the young Surgeon the means to remedy ſuch evils in opening the arteries behind the ears, and thoſe of the temples, with one onely inciſion, as a letting bloud, and not to make a great inciſion, and cut out work for a long time.

The Second.

In the 2. Book chap. of *Periſcythiſm*. In the 26. ch. of the 5. Book of my Works. TO Fluxions which are made a long time upon the Eyes, *Paul Æginete* and *Albucaſis* command to make inciſion, which they call *Periſcythiſmos* or *Augiology* of the Greeks; and ſee here the words of *Paul*: *In this Operation firſt the head is ſhaved, then taking heed of touching the temporal muſcles, a tranſverſe inciſion muſt be made, beginning at the left temple, and finiſhing at the right*; which you have put in your Book word for word, without changing any thing: which ſheweth openly you are a right Wound-maker, as may be ſeen in the Chapter which you call the Crown-cut, which is made half round under the Coronal future from one temple to another, even to the bone. Now I do not teach ſuch a cruel kind of remedy, but inſtruct the Operator by Reaſon, Authority, and notable proof of a ſure and certain way to remedy ſuch affections without butchering men in this kind.

The third Operation.

The third. Book 6. ch. 44. Book 2. ch. 3. Book 3. ch. 22. IN the cure of *Empyema*, *Paul Ægineta*, *Albucaſis* and *Celſus* commanded to apply ſome thirteen, others fifteen Cauteries to give iſſue to the matter contained in the breſt, as the ſaid *Celſus* in the aforeſaid place appointeth for Aſthmatick people, which is a thing out of all reaſon (with reſpect to their honor be it ſpoken) that ſince the Surgeons ſcope is to give iſſue to the matter therein contained, 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

The Fourth Operation.

IN Paps that are too great, *Paul Æginet* and *Albucasis* commands to make a cross-incision, to take out all the fat, and then join together the wound by stitch: in brief, it is to flay a man alive, which I have never practised, nor counsel it to be done by the young Surgeon.

Guido of *Cauliac* the 2. Treatise, doct. 1. c. 1. Book 7. c. 10. book 6. c. 46. book 2. c. 47.

The Fifth Operation.

Albucasis and *Paul Æginet* will cauterize the Liver and the Splene with hot irons, which the Moderns have never practised; for indeed Reason is manifestly repugnant thereunto.

The Sixth Operation.

IN the *Paracentesis* which is made in the third kind of Dropsie called *Ascites*, *Celius Aurelianus* commandeth diverse apertions to be made in the belly. *Albucasis* applies nine actual Cauteries, that is to say, four about the Navel, one upon the Stomach, and one upon the Splene, one upon the Liver, two behind the Spondyls, one of them near the brest, the last near the Stomach. *Ætius* is likewise of the same opinion, to open the belly with diverse cauteries. *Paul Æginet* commands to apply five actual cauteries to make the said *Paracentesis*. But abhorring such a kind of burning, of which you speak much in your third Book. I shew another kind of practice, the which is done by making a simple incision in the said belly, as may be seen in my Works, with happy success, I do not teach young men in my Works the manner of burning, which the Ancients have called *infibulare*, that is not in practice, though *Celsus* writeth of it.

In the first Book ch. 29, and 30. also in b. 2. c. 32. b. 6. c. 47, and 48. In the 5. book ch. 1. *De internis morbis*, book 1. c. 13. book 3. sect. 2. chap. 19. book 6. chap. 50. In the 3. book 12. ch. 6, 7.

The Seventh Operation.

IN the Sciatick proceeding from an internal cause, and because the viscous humours displace the bones, *Paul* commands to burn or cauterize the said joint to the bone: *Dioscorides* commands the same, which I do not find expedient, taking indication from the subjacent parts: for there where one would burn, it is in the place of four twin-muscles, under which passeth the great nerve descending from the Holy-bone; which being burnt I leave it to your censure what might happen, as *Galen* remarketh speaking of the *section* which must be made in the shoulders, called *humerus*.

In the 7. book c. 25. book 6. c. 76. book 2. c. 72. upon the sentence 49. of the first section of the Book of Arts.

The Eighth Operation.

IN the outward luxation of the Spondyls, *Hippocrates* commands to bind 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 ridge of an house, with a great rope in a pully, then to let the Patient fall plumb down upon the hard pavement; which *Hippocrates* says was done in his time. But I do not shew of any such way of giving the Strapado to men; but I shew the Surgeon, in my Work, the way to reduce them surely, and without great pain. Moreover I should be sorry to follow the saying of the said *Hippocrates*, in the third Book *De Morbis*, who commands in the disease called *Volvulus*, to cause the belly to be blown with a pair of Bellows, putting the nosel of them into the *intestinum rectum*, and then blow there till the belly be much stretched, afterwards to give an emollient Clyster, and to stop the Fundament with a Sponge. Such practice as this is not made now adays, therefore wonder not if I have not spoken of it. And you not being contented to patch together the operations of the aboveSaid Authors, you have also taken divers in my Works, as every man may know: which sheweth manifestly that there is nothing of your own in your *Surgeons Guide*. I leave out divers other unprofitable operations which you quote in your Book, without knowing what Beasts they are, in never having seen them practised; but because you have found them written in the Books of the Ancients, you have put them into your Book.

Sentence the 22, and 23. of the third section of the Book of the Joints, c. 16. of the 15 Book.

Moreover you say that you will teach me my lesson in the operations of Surgery, which I think you cannot do: because I have not onely learned them in my study, and by the hearing of many 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 three years in the Hospital of *Paris*, where I had the means to use and learn divers works of Surgery, upon divers Diseases, together with the Anatomy, 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 me seen much more. For being called to the service of the King of *France*, (four of which I have served) I have been in company at Battles, Skirmishes, Assaults and Besieging of Cities and Fortresses; as also I have been shut up in Cities with those that have been besieged, having charge to dress those that were hurt. Also I have dwelt many years in this great and famous City of *Paris*, where (thanks be to God) I have lived in very good reputation amongst all men, and have not been esteemed the least in rank of men of my Profession, seeing there was not any 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 being understood) say you will teach me to perform the works of Surgery, since you never went further than your study? The operations of the same are four in general (as we have declared heretofore) where you may make but three; that is to say, join that which is separated, separate that which was conjoined, and to take away that which was superfluous; and the fourth which I make, is as much necessary, an 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 comes to your part belonging to the Physician. And that the Ancients (in the discourse which you have made to the Reader) have divided the practice of Physick into three kinds, that is to say, Diet, Medicin, and Chirurgery. But I would willingly demand of you, who hath made the partition, and where any thing should be done? who are those which are content with their part, without any enterprise 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 affinity and tie that there is between them two; and it should be very difficult to do otherwise. Now when you will vilifie Chirurgery so much, you speak against your self; for in your Epistle you have dedicated to Monsieur *Martignes*, you say, that Chirurgery is the most noble part of Physick, as well by reason

reason of the original antiquity, necessity, as certainty in her actions; for she works *Luce aperta*, as learnedly writeth *Celsus* in the beginning of the Seventh Book; therefore it is to be believed you never went out of your Study, but to teach *Theorick* (if you have been able to do it.)

A fair similitude.

The operations of Chirurgery are learnt by the eye, and by the touch. I will say that you much resemble a young Lad of *Low-Britany*, of plum buttocks, where was stuff sufficient, who demanded leave of his Father to come to *Paris*, to take *France*; being arrived, the Organist of our Ladies Church met with him at the Palace-gate, who took him to blow the Organs, where he was remaining three years: he saw he could somewhat speak *French*, he returns to his Father, and told him that he spake good *French*, and moreover he knew well to play on the Organs: his Father received him very joyfully, for that he was so wise and learned in a short time. He went to the Organist of their great Church, and prayed him to permit his Son to play on the Organs, to the end he might know whether his Son was become so skilful a Master as he said he was; which the Organist agreed to very willingly. Being entered to the Organs, he cast himself with a full leap to the Bellows; the Master Organist bid him play, and that he would blow: then this good Master answers, *Let him play himself on the Organs if he would for him, he could do nothing but play on the Bellows.* I think also, my little Master, that you know nothing else, but to prattle in a chair; but I will play upon the Keys and make the Organs sound: (that is to say) I will do the operations of Chirurgery, that which you cannot in any wise do, because you have not gone from your Study or the Schools, as I have said before. But also as I have said already in the Epistle to the Reader, that the Labourer doth little profit by talking of the Seasons, discourse of the manner of tilling the Earth, to shew what Seeds are proper to each soil; all which is nothing if he put not his hand to the Plough, and couple the Oxen together. So likewise it is no great matter if you do not know the *Practick*; for a man may execute Chirurgery well, although he have no tongue at all. As *Cornelius Celsus* hath very well remarked in his first Book, when he saith, *Morbos non eloquentia, sed remediis curari, quæ si quis eloquis, usu discretus bene norit, hunc aliquanto majorem medicum futurum quam si sine usu linguam suam excoluerit*; that is to say, Diseases are not to be cured by Eloquence, but by Remedies well and duly applied, which if any wise and discreet man though he have no tongue, know well the use thereof, this man in time shall become the greater Physician, than if without practice his tongue were dipt with Oratory, the which you your self confess in your said Book by a Tetrastich which is thus:

To talk's not all in Chirurgions Art,
But working with the hands;
Aptly to dress each grieved part,
And guide 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 we see these which are experimented, attain sooner to that which they intend, than those which have Reason and not Experience, because that the said Experience is a knowledge of singular and particular things; and Science on the contrary, is a knowledge of things universal. Now that which is particular is more healable than that which is universal; therefore those which have Experience are more wise and more esteemed, than 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 day of himself, that his glory was greater and more famous than that of Counsellors, Presidents, Masters of Request, because that it was by his Science and his Instructions that they became such: but he was answered by a Counsellor, that he was like unto a Whet stone, which made the Knife sharp and ready to cut, not being able so to do it 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 mind (to the publick good) to review and correct your Book, as soon as you can, and not to hold young Chirurgeons in this errour by the reading of the same, where you teach them to use hot irons after the amputation of members, to stay a flux of bloud, seeing there is another means and not so cruel, and more sure and easie. Moreover if to day after an assault of a City, where divers Souldiers have had arms and legs broken and shot off by Cannon-bullets, Cutlas and other instruments of War, to stay the flux of bloud, if you should use hot irons, it would be needful to have a Forge, and much Coals to heat them: and also the Souldiers would hold you in such horrour for this cruelty, that they would kill you like a Calf, even as in times past they did one of the chiefest Chirurgeons of *Rome*, which may be found written before, in the third Chapter of the Introduction of Surgery, the first Book. Now lest the Sectators of your writings should fall into such inconveniency, I pray them to follow the method aforesaid, the which I have shewed to be true and certain, and approved by Authority, Reason, and Experience.

The Voyage of Thurin, 1535.

MOreover I will here shew to the Readers the places where I have had means to learn the Art of Surgery, for the better instructing of the young Surgeon: and first in the year 1536. the King of *France* sent a great Army to *Thurin*, to recover the City and Castles which the Marquess of *Guast*, Lieutenant-General of the Emperour, had taken: where the High Constable of *France* the Great Master, was Lieutenant-General of the Army, and Monsieur *de Montain* Colonel-General of the Foot, of which I was then Surgeon. A great part of the Army arrived in the Country of *Suze*; we

we found the Enemy which ſtopt the paſſage, and had made certain Forts, and Trenches, inſomuch that to hunt them out and make them leave the place, we 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 cauſed partly by one Captain *Ratt*, who climed with divers Souldiers of his company upon a little Mountain; there where he ſhot directly upon the enemies, he received a ſhot upon the ancle of his right foot, wherewith preſently he fell to the ground; and ſaid then, Now is the *Ratt* taken. I dreſſed him, and God healed him. We entered the throng into the City, and paſſed over the dead bodies, and ſome which were not yet dead; we heard them cry under our Horſes feet, which made my heart relent to hear them. And truly I repented to have forſaken *Paris* to ſee ſuch a pitiful ſpectacle. Being in the City, I entered into a Stable thinking to lodge my own, and my mans horſe, where I found four dead Souldiers and three which were leaning againſt the wall, their faces wholly diſtigured, and neither ſaw nor heard, nor ſpake; and their clothes did yet flame with Gun-powder which had burnt them. Beholding them with pitty, there happened to come an old Souldier who asked me if there were any poſſible means to cure them; I told him no: he preſently approached to them, and cut their throats without choler. Seeing this great cruelty I told him he was a wicked man; he anſwered me that he prayed to God, that whenſoever he ſhould be in ſuch a caſe, that he might find ſome one that would do as much to him, to the end he might not miſerably languiſh. And to return to our former diſcourſe, the enemy was ſummoned to render, which they ſoon did, and went out, their lives only 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; Monſieur the Conſtable would not leave them behind, to the end that the way might be 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 they were ſummoned to render, or that they ſhould be cut in pieces; which they flatly refuſed, making anſwer, *That they were as faithful ſervants to the Emperor, as Monſieur the Conſtable could be to the King his Maſter.* This anſwer heard, they made by force of arms, two great Cannons to be mounted in the night with cords and ropes, by the Swiſſers and Lanſquenets; when as the ill luck would have it, the two Cannons being ſeated, a Gunner by great negligence ſet on fire a great bag of gun-powder, wherewith he was burned together with ten or twelve Souldiers; and moreover the flame of the powder was a cauſe of diſcovering the Artillery, 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 killed and hurt a great number of our people.

The next day early in the morning a Battery was made, which in a few hours made a breach, which being made, they demanded to parly 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 luſty Maid of *Piedmont*, which a great Lord would have kept and preſerved for him to keep him company in the night, for fear of the greedy Wolf. The Captain and Enſign were taken alive, but ſoon after were hanged upon the gate of the City, to the end they might give example and fear to the imperial Souldiers not to be ſo raſh and fooliſh, to be willing to hold ſuch places againſt ſo great an army. Now all the ſaid Souldiers of the Caſtle, ſeeing our people coming with a moſt violent fury, did all their endeavor to defend themſelves, they killed and hurt a great company 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 eight Chapter, that wounds made by weapons of fire did participate of Venenoſity, by reaſon of the Powder, and for their cure he commands to cauterize them with oyl of Elders ſcalding-hot, in which ſhould be mingled a little Treacle, and not to fail, before I would apply of the ſaid oyl 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 apply the ſaid oyl, the hotteſt that was poſſible, into the wounds, with Tents and Setons; inſomuch that I took courage to do as they did. At laſt I wanted oyl, and was conſtrained inſtead thereof, to apply a digeſtive of Yolks of Eggs, Oyl of Roſes, and Turpentine. In the night I could not ſleep in quiet, fearing ſome default in not cauterizing, that I ſhould find thoſe to whom I had not uſed the burning oyl, dead impoyſoned; which made me riſe very early to viſit them, where beyond my expectation, I found thoſe to whom I had applied my digeſtive medicin, to feel little pain, and their wounds without inflammation or tumor, having reſted reaſonable well that night: the other to whom was uſed the ſaid burning-oyl 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. Being 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 he called it, wherewith he dreſſed wounds of that kind, and he held me off the ſpace of two years, before I could poſſible draw the Receit from him. In the end by gifts and preſents he gave it me, which was this, To boil young whelps new pupped, in oyl of Lillies, prepared Earth-worms, with Turpentine of *Venice*. Then was I joyful and my heart made glad, that I had underſtood his remedy, 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 *Montain* remained Lieutenant-General for the King in *Piedmont*, having ten or twelve thouſand men in Garriſon through the Cities and Caſtles, who often combated with Swords and other weapons, as alſo with Muskets; and if there were four hurt, I had always 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 me one while this way, another while that way, for to dreſs the appointed Souldiers which were beaten as well in other Cities as that of *Thurin*, inſomuch that I was always in the Country

The retiring of the enemy.

Hiſtory.

Brave anſwer of the Souldiers.

Exemplary puniſhment.

Counſel of De *Vigo*.

Experience of a bold mans happy ſucceſs.

Receit of an excellent balm for wounds with Gun-ſhot.

Country one way or other. Mounsieur the Marshal sent for a Physician to *Milan*, who had no less reputation in the medicinal Art (then the diseased Mounsieur *le Grand*) to take him in hand for an Hepatical flux, whereof at last he died. This Physician was a certain while at *Thurin* to deal with him, and was often called to visit the hurt people, where he always found me, and I consulted with him and some other Surgeons: and when we had resolved to do any serious work of Surgery: 'twas *Ambrose Parey* that put his hand thereto, where I did it promptly, and with dexterity, and with great assurance, in so much that the said Physician admired me, to see me so ready in the operation of Surgery, seeing the small age which I had. One day discoursing with the said Lord Marshal, he said to him, *Signor tu, hai un Chirurgico giovane di anni, me egli ecceldi di sapere e di esperientia. Guarda lo bene, perche egli ti fara servicio & honore.* That is to say, Thou hast a young Surgeon of age, but he is old in knowledge and experience; preserve him well for he will do thee service and honour. But the old man knew not that I had dwelt three years in the Hospital at *Paris*, there to dress the diseased. In the end Mounsieur Marshal died with his Hepatical Flux. Being dead, the King sent Mounsieur the Marshal of *Annebaut* to be in his place, who did me this honour to pray me to dwell with him, and he would use me as well or better than Mounsieur the Marshal *Montain*; which I would not do for the grief I had for the loss of my Master who loved me intimately, and I him in the like manner; and so I came back to *Paris*.

Witness of the dexterity of the Author.

The death of Marshal *Montain*.

The Voyage of Marolle and of Low Britany, 1543.

The voyage of *Marolle* and of *Low Britany*, 1543.

I Went to the Camp of *Marolle*, with the diseased Mounsieur *De Roban*, where King *Francis* was in Prison; and I was Surgeon of the Company of the said Mounsieur *De Roban*. Now the King was advertised by Mounsieur *De Estampes*, Governour of *Britany*, that the English had hoist sail to land in *Low Britany*, and prayed him that he would send Mounsieur *De Roban*, and Mounsieur *De Laval* for succour, because they were the Lords of that Countrey, and for their sakes those of that Countrey would beat back the Enemy and keep them from landing. Having received this advertisement his Majesty dispatched to send the said Lords for the relief of their Countrey, and to each was given as much power as to the Governour, in so much as they were all three the Kings Lieutenants: they took willingly this charge upon them, and speedily they went away in Post: and led me with them to *Landreneau*, there where we found every one in arms, the Alarm-bells sounding on every side, yea, five or six leagues about the *Harbours*, that is to say, *Brest*, *Conquet*, *Crozon*, *Le Fou Dalac*, *Laudanac*, each of them well furnished with Artillery, as Cannons, Demi-cannons, Culverins, Sakers, Serpentines, Falcons, Harquebusses: in brief, there was nothing wanting in Artillery 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 Enemies Army came unto the very mouth of the Cannon, and when we perceived them that they would land, they were saluted with Cannon-shot, and we discovered our Men of War, together with our Artillery; they fled to Sea again: where I was glad to see their Vessels hoise sail again, which was in a great number and in good order, and seemed like a Forest which marched upon the Sea. I saw a thing also whereat I marvelled much, which was, that the bullets of great pieces made great rebounds, 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 found into *England*, and left us in peace. We staid in that Countrey in Garrison, till we were assured that their Army was dispersed. In the mean time our Horsemen exercised their feats of activity, as to run at the Ring, fight in Duel, and others; so that there was still something to imploy me withal. Mounsieur *De Estampes*, to make sport and pleasure to the said Mounsieur *De Roban* and *Laval*, and other Gentlemen, caused divers Countrey Wenches to come to the Feasts, to sing songs in *Low Britain* Tongue, where their harmony was like the croaking of Frogs, while they are in love. Moreover he made them dance the *Britany Triory*, without moving Feet or Buttocks; he made them hear and see much good. Otherwhiles they caused the Wrastlers of the Cities and Towns, to come 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 Britany* of a square body 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 Schoolmaster, who was said to be one of the best Wrestlers of all *Britany*: he entered into the Lists, having taken off his long Jacket, in Hose and Doublet, and being near the little man, he seemed as if he had been tied to his girdle. Notwithstanding when each of them took hold of the Collar, they were a long time without doing any 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 Company laught at the skill and strength of the little Fellow. This great *Datieu* had a great spight, for being cast by so little a man: he rose again in choler, and would have his revenge. They took hold again of each others collar, and were again a good while at their hold without falling to the ground: in the end this great man let himself fall upon the little, and in falling, put his elbow upon the pitch of his stomach, and burst his heart, and killed him stark dead. And knowing he had given him his deaths 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, Vinegar, or any other thing that was presented unto him; I drew near to him, and felt his pulse which did not beat at all, then I said he was dead: then the *Britans* who assisted the Wrestling, said aloud in their jabbering, *That is not in the sport.* And some said that the said *Pedagogue* was accustomed to do so, and that but a year past he had done the like in a Wrestling. I would needs open the body to know the cause of this sudden death, where I found much blood in the *Thorax*, and in the inferiour belly, and I strived to find out any apertion in the place, from whence might issue so great a quantity of blood, which I could not do for all the diligence I could make. Now I believe it was *per Diapedesin*, or *Anastomosin*, that is to say, by the apertion of the mouths of the vessels, or by their porosities: the poor little Wrestler was buried. I took leave of *Messieurs de Roban*,

The English retire.

Dances of the Countrey Wenches.

Wrestlers.

Little *Britain* a good Wrestler.

The little *Britain* killed.

The body opened by the Author.

Rohan, *de Laval*, and *Eſtamps*. Mounſieur *de Rohan* gave me a preſent of fifty double Duckets, and an ambling Horſe, and Mounſieur *de Laval* another for my Man, and Mounſieur *de Eſtamps*, a Diamond of thirty Crowns, and ſo I returned to my houſe at *Paris*.

The Voyage of Perpignan, 1543.

A Little while after Mounſieur *de Rohan* took me with him Poſt to the Camp of *Perpignan*; being there, the Enemy made a Sally forth, and came and incloſed three pieces of our Artillery, where they were beaten back to the Gates of the City: which was not done without hurting and killing many, and amongſt the reſt *de Briſſac*, (who was then chief Maſter of the Artillery) received a Musket ſhot upon the ſhoulders, returning to his Tent; all the others that were hurt followed him, hoping to be dreſt by the Surgeons that ought to dreſs them. Being come to his Tent and laid on his bed, the bullet was ſearched for by three or four the moſt expert Surgeons of the Army, who could not find it, but ſaid it was entered into his body.

In the end he called for me, to ſee if I were more skilful than they, becauſe he had known me before in *Piedmont*: by and by I made him riſe from his bed, and prayed him to put his body into that poſture as it was when he received his hurt; which he did, taking a Javelin between his hands as he held the Pike in the skirmiſh. I put my hand about the wound, and found the bullet in the fleſh, making a little turner under the *Omoplate*: having found it, I ſhewed them the place where it was, and it was taken out by Maſter *Nicholas Laverunt*, Surgeon to Mounſieur the *Dolphin*, who was the Kings Lieutenant in that Army, yet notwithſtanding the honour remained to me for finding it. Addreſs of the Author.

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. He that ſtrook him ſaid, he had heard that he cheated at Dice, and that he had drawn a great ſum of money, 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 he would quickly die: having dreſt him, he 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: he helped him to one who ſtaid with him to the laſt gaſp. The next day the Patient ſent for me by his She-friend in a Boys apparel to come to dreſs him, which I would not do, fearing he ſhould die under my hands; and to put it off, I ſaid I muſt not take off the dreſſing till the third day, by reaſon he would die though he were never touched. The third day he came ſtaggering, and found me in my Tent accompanied with the Wench, and prayed me moſt affectionately to dreſs him, and ſhewed me a Purſe wherein he had an hundred or ſix ſcore pieces of Gold, and that he would content me to my deſire; for all that, yet notwithſtanding I left not off to defer the taking off his dreſſing, fearing leſt he ſhould die at the ſame inſtant. Certain Gentlemen deſired me to go dreſs him, which I did at their requeſt, but in dreſſing him he died under my hands in a Convulſion. Now this Prieſt accompanied him until death, who ſeized upon the Purſe, leſt another ſhould take it, ſaying, he would ſay Maſſes for his ſoul. Moreover he furniſhed himſelf with his cloaths and with all the reſt of his things. I have recited this Hiſtory as a monſtrous thing that the Souldier fell not to ground when he had received this great ſtroke, and was in good ſenſes even till death. Soon after the Camp was broken for divers cauſes; the one becauſe we were advertiſed that four Companies of *Spaniards* were entered into *Perpignan*; the other, that the Plague begun much in our Camp, and it was told us by the People of the Country, that ſhortly there would be a great overflowing of the Sea, which might drown us all; and the preſage which they had, was a very great wind 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 could be given; and the Kitchins being all uncovered, the wind raiſed ſo the duſt and ſand, which ſalted and powdered our meat in ſuch ſort that we could not eat it, ſo that we were conſtrained to boil it in Pots and other veſſels well covered. An Hiſtory.

Now we did not uncamp our ſelves 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 Voyage to Landreſy, 1544.

KIng *Francis* raiſed a great Army to victual *Landreſy*; on the other ſide, the Emperour had no leſs people, yea much more; that is to ſay, eight thouſand *Germans*, ten thouſand *Spaniards*, ſix thouſand *Walloons*, ten thouſand *Engliſh*, and about thirteen or fourteen thouſand Horſe. I ſaw the two Armies near one another, within Canon-ſhot, and it was thought they would never part without giving battel. There were ſome certain fooliſh Gentlemen who would approach the Enemies Camp; certain ſhot was made at them, and ſome died at the place, others had their legs or arms carried away. The King having done what he deſired, which was to victual *Landreſy*, retired himſelf with his Army to *Guiſe*, which was the day after *All-Saints*, One thouſand Five hundred Forty four, and from thence I returned to *Paris*.

The Voyage of Boulogn, 1545.

A Little while after we went to *Boulogn*, where the *Engliſh* ſeeing our Army, left the Forts which they had, that is to ſay, *Moulambert* the little Paradiſe, *Monplaiſir*, the Fort of *Shatillon*, the *Portet*, the Fort *Dardelot*. One day 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 Horſemen which ſtaid to talk with one another. It happened that the bullet paſſed very 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 wind of the ſaid bullet in the midſt of his coat, which went with ſuch a force that all the outward part of the thigh became black and blue, and he had much ado to ſtand. I dreſt him, and made

made him divers ſcarifications to evacuate the contuſed bloud, which the wind of the ſaid bullet had made; and the rebounds that it made on the ground, killed four Souldiers which remained dead in the place. I was not far from this ſtroke, ſo that I felt ſomewhat the moved air, without doing me any more harm than a little fear which made me ſtoop my head very low, but the bullet was already paſſed far beyond me. The Souldiers mocked me to be afraid of a bullet already gone. (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 ſay more? Mounſieur the Duke of *Guiſe*, *Francis of Lorain*, was hurt before *Bullogne* with a ſtroke of a Lance, which above the right eye, declining towards the noſe, entered and paſſed quite through on the other between the *nucha* and the ear, with ſo great 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 be drawn out but with great force, yea with Smiths Pincers. Notwithſtanding all this violence which was not done without breaking of Bones, Nerves, and Arteries, and other parts; my ſaid Lord, by the help of God, was cured: the ſaid Lord went always with open face, which was the cauſe that the Lance went through on the other ſide.

The Voyage of Germany, 1552.

I Went the Voyage to *Germany* in the year 1552. with Mounſieur *de Rohan* Captain of fifty Horſes, where I was Surgeon of his Company, which I have ſaid already. In this Voyage Mounſieur the High Conſtable of *France* was General of the Army: Mounſieur *de Chaſtillon*, ſince Admiral, was chief Colonel of the Foot, having four Regiments of Lanſquenets, under the Conduct of theſe Captains, *Reeroid* 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 very great Company of Foot, accompanied with fifteen hundred Horſe, with the following of each one two Archers, which might make four thouſand and five huddred Horſe, beſides two thouſand Light-Horſe, and as many Muſketiers on Horſe-back, of whom *de Aumalle* was General, beſides the great number of Nobility who came for their pleaſure. Moreover the King was accompanied with two hundred Gentlemen of his houſe, 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 Mounſieur the *Dolphin*, *Meſſieres de Guiſe*, *de Aumalle*, and of the Marſhal of St. *Andrew*, which amounted to four hundred Lances, which was a marvellous thing to ſee ſuch a fair Company; and in this equipage the King entered into *Thou* and *Metz*. I will not omit to tell that it was ordained that the Companions of *Meſſieres de Rohan*, of the Count of *Sancerr*, of *Iarnac*, which was each of them of fifty Horſe, went by the Wings of the Camp; and God knows we had ſcarcity of Victuals; and I proteſt to God, that at three diverſe times I had thought I ſhould have been famiſhed, and it was not for want of money, for I had enough, and we could not have victuals but by force, by reaſon that the Peaſants withdrew it all into the Cities and Caſtles.

One of the Servants of a Captain of the Company of Mounſieur *de Rohan*, went with others thinking to enter into a Church where the Peaſants were retired, thinking to find Victuals by force or love: but amongſt the reſt this man was beaten, and returned with ſeven wounds with a Sword in the head, the leaſt of which penetrated the ſecond table of the ſcull; and he had four other upon the arms, and upon the right ſhoulder, which cut more than one half of the blade-bone, or *Omoplate*. He was brought back to his Maſters Lodging, who ſeeing of him ſo wounded, and they were to depart thence the morrow after at the break of day, and not thinking ever he could be cured, made him a Grave, and would have caſt him therein, ſaying, that or elſe the *Peaſants* would maſſacre and kill him; I moved with pity, told him that he might be cured if he were well dreſt: divers Gentlemen of the Company prayed him that he would cauſe him to be brought along with the Baggage, ſeeing I had the willingneſs to dreſs him; to which he agreed, and after that I had clothed him, he was put up in a Cart upon a Bed well covered and well accommodated, which one Horſe did draw. I did the office of a Phyſician, Apothecary, 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 Horſe-men of the Company of Mounſieur *de Rohan*, the firſt Muſter that was made, gave me each one, one Crown, and the Archers half a Crown.

The Voyage of Danvilliers, 1552.

AT the return from the *German* Camp, King *Henry* 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 traverſe the Tent of Mounſieur *de Rohan*, which hit a Gentlemans leg, which was of his train; which I was fain to finiſh the cutting off, the which was done without applying hot irons.

Another Hiſtory.

The King ſent for Powder to *Sedan*, which being come, they began a greater battery than before, in ſuch ſort that they made a breach. *Meſſiers de Guiſe* and the High Conſtable being in the Kings Chamber, told him that they concluded the next day to make aſſault, and that they were aſſured they ſhould enter into it, and that they ſhould keep it ſecret, leſt the enemy were advertiſed. And all of them promiſed not to ſpeak of it to any one. Now there was a Groom of the Kings Chamber who lay under the Kings bed in the Camp to ſleep, underſtood that they reſolved the next day to give an aſſault; he preſently revealed it to a certain Captain, and told him that for certain, the day following aſſault ſhould be given, and that he had heard it of the King, and prayed the ſaid Captain that he would not ſpeak a word of it to any body, which he promiſed; but his promiſe was not kept; ſo at the ſame inſtant he went and declared it unto a Captain, and this Captain to another Captain, and from the Captains to ſome of the Souldiers, ſaying always, *ſay nothing*. It was ſo well hid that the next day early in the morning, there was ſeen the greateſt part of the Souldiers with their round

hoſe

hoſe and their breeches cut at the knee for the better mounting of the breach. The King was advertiſed of the rumor which run through the Camp, that the aſſault muſt be given, whereof he much marvelled, ſeeing there were but three of that advice, which had promiſed one to another not to tell it to any one. The King ſent for Monſieur *de Guiſe*, to know if he had not talked of this aſſault; he ſwore and affirmed to him he had not told it to any body, and Monſieur the Conſtable ſaid as much; who ſaid to the King, he muſt expreſly know who had declared this ſecret Counſel, ſeeing they were but three. Inquiſition was made from Captain to Captain, in the end the truth was found; for one ſaid it was ſuch an one told me, another ſaid as much, till at length they came to the firſt, who declared he had learned it of a Groom of the Kings 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 he had it, and who told him that this aſſault was to be given. The King told him, that if he did not tell the truth, that he would cauſe him to be hanged; and then he declared, he lay down under his bed thinking to ſleep, and ſo having heard it, he declared it to a Captain who was a friend of his, to the end he might prepare himſelf with his ſouldiers the firſt for the aſſault. After the King knew the truth, he told him he ſhould never ſerve him again, and that he deſerved to be hanged, and forbad him ever to come again to the Court. My Groom of the Chamber went away with this ſad news, and lay with one of the Kings Surgeons in Ordinary, 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 he ſaw the bed bloudy, and the dead body by him, he much marvelled at this ſpectacle upon his waking, and was afraid leſt they ſhould ſay, he was the cauſe of this murther; but was ſoon freed, knowing the cauſe to be from deſperation, having loſt the good amity 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, yielded themſelves to the mercy of the King. The chief of them were priſoners, and the Souldiers ſent away without arms. The Camp being broken up, I returned to *Paris* with my Gentleman whoſe leg I had cut off. I dreſſed him, and God cured him; I ſent him to his houſe merry with his wooden leg, and was content, ſaying that he had eſcaped good cheap, not to have been miſerably burnt, as you write in your book, my little Maſter.

What it is to reveal the ſecrets of Princes.

The Voyage of the Caſtle of Compt. 1552.

A Little while after, King *Henry* levied an Army of thirty thouſand men, to go make ſpoil about *Hedin*. The King of *Navarre* who was then called Monſieur *de Vendoſme*, was chief of the Army, and the Kings Lieutenant. Being at S. *Dennis* in *France*, ſtaying while the Companies paſſed by, he ſent for me to *Paris* to come ſpeak with him; being there, he prayed me, and his requeſt was a command, that I would follow him this Voyage; and I about to make my excuſe, told him my wife was ſick in her bed; he made me anſwer, That there were Phyſicians at *Paris* to cure her; and that he as well left his own, who was as well deſcended as mine; promiſing me that he would uſe me well, and forthwith gave command that I ſhould be lodged as one of his Train. Seeing this great affection, which he had to lead me 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 Emperors Souldiers in garriſon with a number of Peaſants round about; he cauſed them to be ſummoned to render themſelves; 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 themſelves. They put confidence in their ditches full of water, and in two hours with a great number of Bavins, and certain empty Casks, way was made to paſs over the Foot, when they muſt go 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 very 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 themſelves conſtrained, they put fire to their powder and munition, which was the cauſe of burning many of our people, and theirs likewiſe, and they were all almoſt put to the ſword. Notwithſtanding ſome of our Souldiers had taken twenty or thirty, hoping to have ranſom for them. That was known, and ordered by the Council, that it ſhould be proclaimed by the Trumpet through the Camp, that all Souldiers who had any *Spaniards* priſoners, were to kill them, upon pain to be hanged and ſtrangled, which was done upon cold bloud. From thence we went and burnt divers Villages whoſe barns were full of all kind of Grain, to my grief. We went along even to *Tournahan*, where there was a very 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 Gunpowder turned topſie-turvy. After that, the Camp was broken up, and I returned to *Paris*. I will not yet forget to write that the day after the Caſtle of *Compt* was taken, Monſieur *de Vendoſme* ſent a Gentleman to the King to make report to him of all which had had paſſed, and amongſt other things, told the King that I had greatly done my duty 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 find, nor draw out, and told more good of me than there was by half. Then the King ſaid he would have me into his ſervice, and commanded Monſieur *de Goguier* his chief Phyſician to write me down as entertained one of his Surgeons in ordinary, and that I ſhould go meet with him at *Rheimes* within ten or twelve days, which I did, where he did me the honour to command me that I would dwell near him, and that he would do me good. Then I thankt him moſt humbly for the honour it pleaſed him to do me, in calling me to his ſervice.

The King of *Navarre* prayed the Author to follow him.

Hiſtory of deſperate people.

The taking of the Caſtle of *Compt*.

The Voyage of Mets. 1552.

THE Emperor having beſieged *Metz*, and in the hardeſt time of winter, as each one knows of freſh memory: and that there was in the City five or ſix thouſand men, and amongſt the

The names of the Princes who were at the siege of *Mets*.

reſt ſeven Princes; that is to ſay, Monſieur the Duke of *Guiſe* the Kings Lieutenant, *Meſſieurs d' Anguien, de Conde, de Montpenſier, de La Roch* upon *Yon*, Monſieur *de Nemours*, and divers others Gentlemen, with a number of old Captains of War, who often made ſallies forth upon the enemies, (as we ſhall ſpeak hereafter) which was not without ſlaying many, 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 cauſed Monſieur *de Guiſe* and other Princes to ſend to the King for me, and that he would ſend me, with Drugs to them, for they believed theirs were poiſoned, ſeeing that of their hurt people few eſcaped. I do not believe there was any poyſon, but the great ſtrokes of the Cutlaſſes, musket-ſhot, and the extremity of cold was the cauſe. The King cauſed one to write to Monſieur the Marſhal of S. *Andrew*, who was his Lieutenant at *Verdun*, that he found

Nota.

ſome means to make me 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 me enter in, which he did, and for which he had fifteen hundred Crowns: the King having heard of the promiſe which the *Italian* Captain had made, ſent for me, and commanded me to take of his Apothecary named *Daigne*, ſuch and as many Drugs as I ſhould think fit for the hurt who were beſieged, which I did, as much as a poſt horſe could carry. The King gave me charge to ſpeak to Monſieur *de Guiſe*, and to the Princes,

Commiſſion of the Author.

and Captains who were at *Mets*. Being arrived at *Verdun*, a few days after the Monſieur the Marſhal of S. *Andrew*, cauſed horſes to be given to me, and my man, and for the *Italian*, who ſpake very good high *Dutch*, *Spaniſh* and *Walloon*, with his own natural tongue. When we were within eight or ten Leagues of *Mets*, we went not but in the night, and being near the Camp, I ſaw a league and half off bright fires about the City, which ſeemed as if all the earth had been on fire, and I thought we could never paſs through thoſe fires without being diſcovered, and by conſequent be hanged and ſtrangled, or cut in pieces, or pay a great ranſom. To ſpeak truth, I wiſhed my ſelf at *Paris*, for the imminent danger which I foreſaw. God guided ſo well our affairs that we entred the City at midnight with a certain Token, which the Captain had with another Captain of the Company of Monſieur *de Guiſe*: which Lord I went to, and found him in bed, who received me with great thanks, being joyful of my coming. I did my meſſage to him of all that the King had commanded me to ſay to him: I told him I had a little letter to give to him, and that the next day I would not fail to deliver it him. That done, he commanded me a good lodging, and that I ſhould be well uſed, and bid me I ſhould not fail to be the next day upon the Breach, where I ſhould meet with all the Princes, and divers Captains; which I did; who received me with great joy, who did me the honour to embrace me, and tell me I was very welcome, adding withall they did not fear to die if they ſhould chance to be hurt. Monſieur *de La Roch* upon *Yon* was the firſt that feaſted me, and inquired of me what they ſaid at the Court concerning the City of *Mets*: I told him what I thought good. Then preſently he deſired me to go ſee one of his Gentlemen, named Monſieur *de Magnane*, at this preſent Knight of the Kings Order, and Lieutenant of his Majeſties Guard, who had his leg broken by a Cannon-ſhot. I found him in his bed, his leg bended and crooked, without any dreſſing upon it; becauſe a Gentleman promiſed him

Hiſtory.

cure, having his name and his girdle, with certain words. The poor Gentleman wept and cried with pain which he felt, not ſleeping night nor day, in four days: then I mocket at this impoſture and falſe promiſe. Preſently I did ſo nimbly reſtore and dreſs his leg, that he was without pain, ſlept all night, and ſince (thanks be to God) was cured, and is yet at this preſent living, doing ſervice to the King. The ſaid Lord of the *Roch* upon *Yon* ſen me a tun of wine to my lodging, and bid tell me, when it was drunken, he would ſend me another. That done, Monſieur *de Guiſe* gave me a liſt of certain Captains and Lords, and commanded me to tell them what the King had given me in charge; which I did, which was to do his commendations and thankſgiving for the duty they had done and did in the keeping of the City of *Mets*, and that he would acknowledge it. I was more than eight days in acquitting my charge, becauſe they were many; firſt to the Princes and others, as the Duke of *Horace*, the Count of *Martiges*, and his brother Monſieur *de Bauge*, the Lords *Montmorancy* and *d' Anville*, the Marſhal of *France* Monſieur *de la Chapel*, *Bonnivet Carong* now Governour of *Roban*, the *Vedaſme* of *Chartres*, the Cont of *Lude*, Monſieur *de Biron* now Marſhal of *France*, Monſieur *de Rondan* the *Rochfoucaut*, *Bozedalle d' Errez* the younger, Monſieur *de S. John* in *Dolphiny*, and many others which it would be too long to recite; and chiefly to divers Captains who had very well done their duty in defence of their lives and City. I demanded afterwards of Monſieur *de Guiſe*, what pleaſed him I ſhould do with the Drugs which I had brought him; he bid me impart them to the Surgeons and Apothecaries, and chiefly to the poor hurt Souldiers in the Hoſpital which were in great number; which I did and can aſſure you, I could not do ſo much as go and ſee them, but they ſent for me to

The hurt of Monſieur *de Pienne* trepand and cured.

viſit and dreſs them. All the beſieged Lords prayed me carefully to ſolicite 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 depreſſion of the bone. They told me that preſently when he received the ſtroke, he fell to the earth as dead, and caſt blood out of his mouth, noſe and ears, with great vomitings, and was fourteen days without ſpeaking one word, or having any reaſon; there happened to him alſo ſtartings ſomewhat like Convulſions, and he had all his face ſwelled and livid. He was trepand on the ſide of the temporal muſcle upon the *Os Coronale*. I dreſt him with other Surgeons, and God cured him; and he is at this day living, God be thanked. The Emperor cauſed battery to be made with forty double Cannons, where they ſpared no powder night nor day. Preſently when Monſieur *de Guiſe* ſaw the Artillery ſeated to make a breach, he made the neareſt houſes be 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 enemy ſhould be lodged, cloſe covered, and that they ſhould not help themſelves with any wood, ſerved well to repair

Princes carried the Baskets.

the breach. Every one was buſied to carry earth to make the Ramparts night and day. *Meſſieres*, the Princes, Lords and Captains, Lieutenants, Enſigns, did all carry the Basket, to give example to

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the Souldiers and Citizens to do the like, which they did: yea, both Ladies and Gentlewomen, and thoſe which had not Baskets, helped themſelves with Kettles, Panniers, Sacks, Sheets, and with what elſe they could to carry Earth; in ſo much that the Enemy had no ſooner beaten down the Wall, but he found behind it a Rampart more ſtrong. The Wall being fallen, 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 be ſome Traitor who would give them intelligence what was done in the City; 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.*

Truly the Imperialiſts were very much vexed to have been ſo long making a Breach, and at ſo great expence, which was the breach of fourſcore ſteps, to enter fifty men in front, where they found a Rampart more ſtrong than 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 Mounſieur *de Guiſe*. The day before there was a great preſs to make themſelves enrolled, who muſt make the ſalley, chiefly of the young Nobility, led by well experimented Captains. In ſo much that it was a great favour to permit them to ſally forth and run upon the Enemy: and they ſallied forth always the number of one hundred or ſixſcore armed men with Cutlaſſes, Muskets, Piſtols, Pikes, Partiſans, and Halberts, which went even to their Trenches to awaken them. Where they preſently made an Alarm throughout all their Camp, and their Drums ſounded *plan, plan, ta, ti, ta, ta, ti, ta, ta, tou, touf, touf:* likewiſe their Trumpets and Cornets ſounded, *to the ſaddle, to the ſaddle, to the ſaddle, to horſe, to horſe, to horſe, to the ſaddle, to horſe.* And all their Souldiers cried, *Arm, arm, arm, to arms, to arms, to arms, arm, to arms, arm, to arms, arm, to arms*, like the cry after Wolves, 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 ſuccour their fellows who had their throats cut like Sheep. The Horſe-men likewiſe came from all parts a great gallop, *Patati, patata, patati, patata, ta, ta, patata, patata*, and tarried well, that they might not be in the throng, where ſtroaks were imparted to give and receive. And when our men ſaw they were forced, they returned into the City, ſtill firing, and thoſe who run after were beaten back with the Artillery which they had charged with Flint-ſtones, and four-ſquare pieces of Iron; and our Souldiers who were upon the ſaid Wall made a volly of ſhot, and ſhoured 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 come off with whole ſkins, and there ſtill remained ſome for the Tithe, who were joyful to die in the Bed of Honour. And when there was a Horſe hurt, he was flayed, 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 days after other Sallies were made, which did much anger the Enemies, becauſe they did not let them ſleep but little in ſafety. Mounſieur *de Guiſe* made a War-like ſtratagem, which was, He ſent a Peſant who was none of the wiſeſt with two pair of Letters toward the King, to whom he gave ten crowns, and promiſed the King ſhould give him an hundred, provided he gave him the Letters. In the one he ſent word that the Enemy made no ſign of retiring himſelf, and by all force made a great breach, which he hoped to defend, yea to the loſing of his life, and of all thoſe that were within; and that the Enemy had ſo well placed his Artillery in a certain place which he named, that with great difficulty it was kept that they had not entered into it, ſeeing it was a place the moſt weak of all the City: but he hoped quickly to fill it up again in ſuch ſort, that they cannot be able to enter. One of theſe Letters was ſewed in the lining of his doublet, and he was bid to take heed that he told it not to any man. And there was alſo another given to him, wherein the ſaid Mounſieur *de Guiſe* ſent word to the King, that he and all the beſieged did hope well to keep the City, and other matters which I ceaſe to ſpeak of. They made the Peſant go forth in the night, and preſently after he was taken by one that ſtood Sentinel, and carried to the Duke of *Albe* to underſtand what was done in the City, and they asked him if he had any Letters, he ſaid yes, and gave them one; and having ſeen it, he was put to his Oath whether he had any other, and he ſwore, not; then they felt and ſearched him, and found that which was ſewed to his doublet, and the poor meſſenger was hanged.

The ſaid Letters were communicated to the Emperour, who cauſed his Council to be called there. Where it was reſolved, ſince they could do nothing at the firſt breach, that preſently the Artillery ſhould be drawn to the place which they thought the moſt weak, where they made great attempts to make another breach, and digged and undermined the Wall, and endeavoured to take the Tower of Hell, yet they durſt not come to the aſſault. The Duke of *Albe* declared to the Emperour that the Souldiers died daily, yet more than the number of two hundred, and that there was but little hope to enter into the City, ſeeing the Seaſon, and the great quantity of Souldiers that were there. The Emperour demanded what people they were that died, and if that they were Gentlemen of remark or quality; anſwer was made, that they were all poor Souldiers; then ſaid he it makes no matter if they die, comparing them to Caterpillars and Graſhoppers, which eat the buds of the Earth. And if they were of any faſhion, they would not be in the Camp for twelve ſhillings the Month; and therefore no great harm if they died. Moreover he ſaid, He would never part from before that City, till he had taken it by Force or Famine, although he ſhould loſe all his Army; by reaſon of the great number of Princes which were therein, with the moſt part of the Nobility of *France*. From whom he hoped to draw double his expence, and that he would go once again to *Paris*, to viſit the Pariſians, and make himſelf King of all the Kingdom of *France*. Mounſieur *de Guiſe*, with the Princes, Captains, and Souldiers, and generally all the Citizens of the City, having underſtood the intention of the Emperour, 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 themſelves to eat either freſh Fiſh, or Veniſon, as likewiſe ſome Partridges,

Woodcocks, Larks, Plovers, for fear left they had gathered some peſtilential air which might give us any contagion; but that they ſhould content themſelves with the Ammunition Fare; that is to ſay, with Biſket, Beef, powdered Cows Lard, and Gammons of Bacon: Likewiſe Fiſh, as Green-fiſh, Salmon, Sturgeon, Anchovies, Pilchers, and Herrings; alſo Peaſe, Beans, Rice, Garlick, 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 a very ill taſte; divers Citizens having Gardens in the City, ſowed therein great Radiſhes, Turnips, Carrets, and Leeks, which they kept well and full dear againſt the extremity of hunger. Now all theſe Ammunition Victuals were diſtributed by weight, meaſure, and juſtice, according to the quality of the perſon, becauſe we knew not how long the Siege would laſt. For having underſtood from the mouth of the Emperour, that he would never part from before *Metz* till he had taken it by Force or Famine; the victuals were leſſened, for that which was wont to be diſtributed to three, was now ſhared amongſt four, and defence 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 always from Table with an appetite, for fear they ſhould be ſubject to take Phyſick. And before we would yield our ſelves to the mercy of our Enemies, had reſolved to eat our Aſſes, Mules, Horſes, Dogs, Cats, and Rats; yea, our Boots, and other Skins which we could ſoften and frie. All the beſieged did generally reſolve to defend themſelves with all ſorts of Inſtruments of War; that is to ſay, To rank and charge the Artillery, at the entry of the breach, with Bullets, Stones, Cart-nails, Bars and Chains of iron. Alſo all kinds and differences of artificial Fire, as Boerres, Bariquadoes, Granadoes, Ports, Lances, Torches, Squibs, burning-Faggots. Moreover, Scalding Water, melted Lead, Powder of unquencht Lime to blind their eyes. Alſo they were reſolved to have made holes through and through their houſes, there to lodge Muſquetiers, there to batter in the flank and haſten them to go, or elſe make them lie for altogether. Alſo there was order given to the Women to unpave the ſtreets, and to caſt out at their Windows, Billets, Tables, Treſſes, Forms, and Stools, which would have troubled their brains: Moreover, there was a little further a ſtrong Court of Guard, filled with Carts and Palliſadoes, Pipes and Hogſheads filled with earth for Barricadoes to ſerve to interlay with Faulcons, Faulconets, Field-pieces, Harquebuſſes, Muskets, and Piſtols, and Wild-fire, which would have broken legs and thighs, in ſo much that they had been beaten in head, in flank, and in tail; and when they had forced this Court of Guard, there was others at the croſſing of the ſtreets, each diſtant an hundred ſpaces, who had been as bad companions as the firſt, and would not have been without making a great many Widows and Orphans. And if Fortune would have been ſo much againſt us, as to have broken our Courts of Guard, there was ſeven great Baſtallions ordered in ſquare and triangle to combat altogether, each one accompanied with a Prince to give them boldneſs, and encourage them to fight, even till the laſt gaſp, and to die all together. Moreover it was reſolved, that each one ſhould carry his Treaſure, Rings, and Jewels, and their Houſhold-ſtuff of the beſt, to burn them in the great place, and to put them into aſhes rather then the Enemy 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 Casks, others to put the fire in each houſe, to burn our Enemies and us together: the Citizens had accorded it thus, rather then to ſee the bloudy Knife upon their Throat, and their Wives and Daughters violated, and to be taken by force by the cruel inhumane *Spaniards*. Now we had certain Priſoners which Mounſieur *de Guiſe* ſent away upon their Faith, to whom was ſecretly imparted our laſt reſolution, will and deſperate minds; who being arrived in their Camp, do not defer the publiſhing, which bridled the great impetuoſity and will of the Souldiers to enter any more into the City to cut our Throats, and to enrich themſelves of our pillages. The Emperour having underſtood this deliberation of the great Warriour the Duke of *Guiſe*, put Water in his Wine, and reſtrained his great choler and fury; ſaying, He could not enter into the City without making a great ſlaughter and butchery, and ſpill much blood, as well of the Defendants as of the Aſſailants, and that they ſhould be dead together, and in the end could have nothing elſe but a few aſhes, and that afterward it might be ſpoken of that, as of the deſtruction of *Jeruſalem* already made by *Titus* and *Veſpaſian*. The Emperour then having underſtood our laſt reſolution, and ſeeing their little prevailing by their battery and undermining, and the great Plague which was in his whole Army, and the indiſpoſition of the Time, and the want of Victuals and Money, and that his Souldiers forſook him, and went away in great companies; concluded in the end to retire themſelves, accompanied with the Cavalry of the Van-guard, with the greateſt part of his Artillery, and the Battalia. The Marqueſs of *Brandenburg* was the laſt which decamped, maintained by certain Bands of *Spaniards*, *Bohemians*, and his *German* Companies, and there remained one day and a half after, to the great grief of Mounſieur *de Guiſe*, who cauſed four pieces of Artillery to be brought out of the City, which he cauſed to be diſcharged at him on one ſide, and the other to haſten them to be gone, which he did full quickly, with all his Troops. He being a quarter of a league from *Metz*, was taken with a fear left our Cavalry ſhould fall upon him in the Rere, which cauſed him to put fire to his Munition Powder, and leave certain pieces of Artillery, and much Baggage, which he could not carry, becauſe the Van-guard, and the Battalia, and great Cannons, had too much broken the way. Our Horſe-men would by all means have gone out of the City to have fallen upon their breech, but Mounſieur *de Guiſe* would never permit them, but on the contrary we ſhould rather make plain their way, and make them Bridges of Gold and Silver, and let them go, being 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 City of *Metz*, which was the day after *Chriſtmas* day, to the great contentment of the beſieged, and honour of Princes, Captains, and Souldiers, who had endured the travels of this Siege the ſpace of two moneths. Notwithſtanding they did not all go; there wanted twenty thouſand who were dead, as well by Artillery, as by the Sword, as alſo by the Plague, Cold, and Hunger,

hunger, and for ſpite they could not enter into the City 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 earth all digged like St. *Innocents* Church-yard in the time of the Plague. They did likewiſe leave in their Lodgings, Pavillions and Tents, divers ſick people; alſo Bullets, Arms, Carts, Waggons, and other Baggage, with a great many of Munition Loaves, 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, and Graſs-plats filled with Fruit-trees, for without that they had been ſtarved with cold, and had been conſtrained to have raiſed the Siege ſooner. The ſaid Mounſieur *de Guiſe* cauſed the dead to be buried, and dreſs their ſick people; likewiſe the Enemies left in the Abby of St. *Arnoul* divers of their hurt Souldiers which they could not lead with them; the ſaid Mounſieur *de Guiſe* ſent them all victuals enough, and commanded me and other Surgeons to go dreſs them and give them Medicins; which we willingly did, and think they would not have done the like toward others (becauſe the *Spaniard* is moſt cruel, perfidious, and inhumane, and therefore Enemy to all Nations) which is proved by *Lopez* a *Spaniard*, and *Benzo* of *Milan*, and others who have written the Hiſtory of *America*, and the *Weſt-Indies*, who have been conſtrained to confeſs that the cruelty, avarice, blaſphemy, 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 than the idolatrous *Indians*, by the cruel uſage done to the ſaid *Indians*.

And after a few days we ſent a Trumpet to *Thionville* toward the Enemy, that they ſhould ſend back for their wounded men in ſafety, which they did with Carts and Waggons, but not enough. Mounſieur *de Guiſe* cauſed them to have Carts and Carters to help to carry them to the ſaid *Thionville*. Our ſaid Carters being returned back, brought us word the way was paved with dead bodies, and that they never led 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 Carters ſaid, they met by the way 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 cauſe of their mortality, which was principally through Hunger, Plague, 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 than fine gold, and every day had white ſheets, and lodged at the ſign of the Moon, and made good chear when they had it, and paid their Hoſt ſo well overnight, that in the morning they went away quite, ſhaking their ears, and they needed no Comb to take away the down out of their hairs either of head or beard, and found always 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 Shoes, and divers had rather have none than have them, becauſe they were always in mud, half way of the leg; and becauſe they went bare-legged, we called them the Emperours Apoſtles. After the Camp was wholly broken, I diſtributed my Patients into the hands of the Surgeons of the City, to finiſh their Cure: then I took leave of Mounſieur *de Guiſe*, who came back toward the King, who received me with a loving countenance, and demanded of me how I did enter into the City of *Mets*. I recounted to him all that I had done, he cauſed two hundred Crowns to be given me, and one hundred I had at my going out, and told me he would not leave me poor; then I thanked him moſt humbly for the good and the honour which he pleaſed to do me.

The Voyage of Hedin, 1553.

CHarles the Emperour cauſed the City of *Therouenne* to be beſieged, where Mounſieur the Duke of *Savoy* was General of the whole Army: it was taken by aſſault where there was a great number of our men ſlain and priſoners. The King willing to prevent that the Enemy ſhould not alſo come to beſiege the City and Caſtle of *Hedin*, ſent Meſſiers the Duke of *Bouillon*, the Duke *Horace*, the Marqueſs of *Villars*, a number of Captains, and about eight hundred Souldiers, and during the ſiege of *Therouenne*, the ſaid Lords fortified the ſaid Caſtle of *Hedin*, in ſuch ſort that it ſeemed impregnable. The King ſent me to the ſaid Lord to help them with my Art, if there were any need. Now ſoon after the taking of *Therouenne*, we were beſieged with the Army: there was a quick clear Fountain of Spring, within Cannon-ſhot, where there was about fourſcore 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 many idlers about the ſaid Fountain, I prayed Mounſieur *de Pont* Commiſſary of the Artillery, to make one Cannon-ſhot at that roguiſh Company; he made me much denial, anſwering me that ſuch kind of people were not worth the Powder they ſhould waſte. Again I prayed him to level the Cannon, telling him, *the more dead the fewer Enemies*; which he did through my requeſt, and at that ſhot fifteen or ſixteen were killed, and many hurt. Our Souldiers ſallied forth upon the Enemies, where there was many killed 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 day for dreſſing the wounded. And I will tell this by the way, that we had put many 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 any. Whileſt the battery was making, as many 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 cried his head, the other his arm, and ſo of other parts; divers of their wounds bled afreſh, yea in greater quantity than firſt when they were wounded, and then it was I muſt run to ſtay 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 believe they would have ſlain you like a Calf for this cruelty. Now through this Diabolical tempeſt of the Ecchо 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 becauſe they could not reſt by reaſon of the groans and cries that they made night and day, and alſo for want of good nouriſhment, and other good uſage neceſſary to wounded people. Now my little Maſter, if you had been there, you would hardly have given them Gelly, Reſtauratives, Cullifes, Preſſures, Panado, cleanſed Barley, White Meats, Almond-milk, Prunes, Raiſins, and other proper meats for ſick people: your ordinance would onely have been accompliſhed in paper, but in effect they could have had nothing but old Cow-beef, which was taken about *Hedin* for our Munition, ſalted and half boiled, in ſo much that who would have eat it, he muſt pull it with the force of his teeth, as Birds of Prey do Carrion. I will not forget their Linen wherewith they were dreſt, which was onely rewaſhed every day, and dried at the fire, and therefore drie and ſtubborn like Parchment. I leave you to think how their wounds could heal well. There were four[4] luſty Whores to whom charge was given to waſh their Linen, who diſcharged their duty under penalty of the Battoon, and alſo they wanted both Sope and Water. See then how the ſick People died for want of nouriſhment, and other neceſſary things. One day our Enemies feigned to give us a general Aſſault, to draw our Souldiers upon the breach, to the end to know our countenance and behaviour: every one ran thither; we had made great proviſion of artificial Fire to defend the breach: a Prieſt belonging to Mounſieur *Du Bouillon* took a Granado, thinking to throw it on the Enemies, and ſet it on fire ſooner than it ought to have done; it brake aſunder, and the fire fell amongſt our Fire-works, which were put into a houſe near the breach, which was to us a marvellous diſaſter, becauſe it burned many poor Souldiers: it alſo took hold on the houſe it ſelf, and we 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 we took Beer and quenched it: then afterwards we had great ſcarcity of Water, and to drink the reſt that remained, which we muſt ſtrain through Napkins.

Now the Enemy ſeeing this ſmoke and tempeſt of the Fire-works, which caſt a very great flame or claſhing noiſe, they believed we had put the fire on purpoſe for the defence of our breach, to burn them, and that we had great ſtore of others. That made them to be of another opinion than to take us by aſſault; they did undermine, and dig under the greateſt part of our Walls, ſo that it was the way to overthrow wholly the Caſtle topſie-turvy, and when the Mines were finiſhed, and that their Artillery ſhot, the whole Caſtle did ſhake under us like an Earthquake, which did much aſtoniſh us. Moreover he had levelled five pieces of Artillery which they had ſeated upon a little hill, to play upon our backs when we would 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 body on the other, without being able to ſpeak one onely word. His death was to us a great diſaſter for the rank which he held in his place.

Likewiſe Mounſieur *De Martigues* had a ſtroke with a bullet which pierced through his Lungs; I dreſſed him, as I will declare hereafter. Then we demanded Parl, and a Trumpet was ſent toward the Prince of *Piedmont*, to know what compoſition it pleaſed him to make us: His anſwer was, that all the Chief, as Gentlemen, Captains, Lieutenants, and Enſigns, ſhould be taken for ranſom, and the Souldiers ſhould go out without Arms; and if they refuſed this fair and honeſt proffer, the next day we ought to be aſſured they would have us by aſſault, or otherwiſe. Council was held, where I was called to know if I would ſign, as divers Captains, Gentlemen, and others, that the place ſhould be rendred up. I made anſwer it was not poſſible to be held, and that I would ſign it with my proper bloud, for the little hope that I had that we could reſiſt the Enemies force, and alſo for the great deſire which I had to be out of this Torment and Hell; for I ſlept not either night or day, by reaſon of the great number of hurt people, which were about two hundred. The dead bodies yielded a great putrefaction, being heaped one upon another like Fagots, and not being covered with earth, becauſe we had it not; and when I entered into one lodging, Souldiers attended me at the door to go and dreſs others at another; when I went forth, there was ſtriving who ſhould have me, and they carried me like a Holy body, not touching the ground with my foot, in ſpite one of another; nor could I ſatisfie ſo great a number of hurt people. Moreover I had not what was neceſſary to dreſs them withall; for it is not ſufficient that the Surgeon do his duty towards the Patients, but the Patient muſt alſo do his, and the aſſiſtants and all exteriour things, witneſs *Hippocrates* in his firſt Aphoriſm. Now having underſtood the reſolution of the yielding up of our place, I knew our affairs went not well; and for fear of being known, I gave a Velvet Coat, a Satin Doublet, a very fine Cloth Cloak lined with Velvet, to a Souldier, who gave me a ſcurvy old torn doublet cut and ſlaſht with uſing, and a leather Jerkin well examined, and an ill-favoured Hat, and a little Cloak; I ſmucht 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 at the heels as if they had been wore a long time, and I did as much to my ſhoes, in ſo much that they would rather take me for a Chimney-Sweeper than a Kings Surgeon. I went in this Equipage towards Mounſieur *De Martigues*, where I prayed him that he would take order that I might remain near him to dreſs him, which he agreed 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, entered into the Caſtle the ſeventeenth day of *July*, One thouſand Five hundred Fifty three, where they made *Meſſieures* the Duke of *Bouillon*, the Marqueſs of *Villars*, the Baron of *Culan*, Mounſieur *Du Poet* Commiſſary of the Artillery, and Mounſieur *De Martigues* and I to be taken through the requeſt that he made to them; and all other Gentlemen which they could perceive were able to

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pay any ranſom, and the moſt part of the Souldiers and the chief of Companies, having ſuch and ſo many Priſoners as they would.

Afterward the *Spaniſh* Souldiers entered by the breach without any reſiſtance, for ours eſteemed they would hold their Faith and Compoſition that they ſhould have their lives ſaved. They entered in with a great fury to kill, pillage, and to rifle all they retained: ſome 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 themſelves 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 fallen into a Gangrene and total Mortification; but they killed them all with their Daggers, and cut their Throats. See now their great cruelty and perfidiouſneſs, let him truſt to it that will. Now to return to my purpoſe; Being led from the Caſtle to the City with Mounſieur *De Martigues*, there was a Gentleman of the Duke of *Savoys*, who asked me if Mounſieur *De Martigues* wound were curable, I anſwered not; who preſently went and told the Duke of *Savoy*; now I thought he would ſend Phyſicians and Surgeons to viſit and dreſs my ſaid Mounſieur *De Martigues:* in the mean time I thought with my ſelf whether I ought to make it nice, and not to acknowledge my ſelf a Surgeon, for fear leſt they ſhould retain me to dreſs their wounded, and in the end they would know I was the Kings Surgeon, and that they would make me pay a great ranſom. On the other ſide I feared, if I ſhould not make my ſelf known to be a Surgeon, and to have carefully dreſſed Mounſieur *De Martigues*, they would cut my Throat, ſo that I took a reſolution to make it appear to them he would not die for want of good dreſſing and looking to. Soon after, ſee, there were divers Gentlemen accompanied with the Phyſician and Surgeon of the Emperour, and thoſe of the ſaid Duke of *Savoy*, with ſix other Surgeons following the Army, to ſee the hurt of the ſaid Lord of *Martigues*, and to know of me how I had dreſſed him, and with what Medicins. The Emperours Phyſician bid me declare the eſſence of the wound, and how I had dreſt it. Now all the aſſiſtants had a very attentive ear to know if the wound were mortal or not; I began to make a diſcourſe that Mounſieur *De Martigues* looking over the Wall to perceive them that did undermine it, received a ſhot from an Arquebus quite through the body; preſently I was called to dreſs him, I ſaw he caſt out bloud out of his mouth and his wounds. Moreover he had a great difficulty of breathing, and caſt out wind by the ſaid wounds with a whiſtling, in ſo much that it would blow out a candle; and he ſaid he had a moſt ſharp pricking pain at the entrance of the bullet. I do believe and think it might be ſome 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 fifth rib with pieces of bones which had been driven from within outward; I drew out ſome, but not all, becauſe they were very deep and adherent. I put in each wound a Tent, having the head very large, tied with a thred, leſt by the inſpiration it might be drawn into the capacity of the *Thorax*, which hath been known by experience to the detriment of the poor wounded; for being fallen in, it cannot be taken out, which is the cauſe that engenders putrefaction, a thing contrary to Nature. The ſaid Tents were anointed with a Medicin compoſed of Yolks of Eggs, Venice Turpentine, with a little Oil of Roſes. My intention for putting the Tents was to ſtay the flux of bloud, 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 be given for the bloud that was ſpilt within the *Thorax*. I put upon the wound great Emplaſters of *Diacalcitheos*, in which I had relented Oil of Roſes and Vinegar to the avoiding of the inflammation; then I put great ſtupes of *Oxycrate*, and bound him up, but not too hard, to the end he might have eaſie reſpiration; that done I drew from him five porringers of bloud from the Baſilick vein of the right arm, to the end to make revulſion of the bloud which runs from the wounds into the *Thorax*, having firſt taken indication from the wounded part, and chiefly his forces, conſidering his youth and ſanguin temper; He preſently after went to ſtool, and by his Urin and Siege caſt great quantity of bloud. And as for the pain which he ſaid he felt at the entrance of the bullet, which was as if he had been pricked with a bodkin, that was becauſe the Lungs by their motion beat againſt the ſplinters of the broken rib. Now the Lungs are covered with a coat coming from the membrane called *Pleura*, interweaved with Nerves of the ſixth Conjugation from the brain, which was cauſe of the extreme pain he felt; likewiſe he had great difficulty of breathing, which proceeded from the bloud which was ſpilt in the capacity 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 expiration and the inſpiration; and likewiſe becauſe the Lungs were torn and wounded by the bullet, which hath cauſed him ever ſince to ſpit black and putrid bloud in coughing. The Fever ſeized him ſoon after he was hurt, with faintings and ſwoonings. It ſeemed to me that the ſaid Fever proceeded from the putredinous vapours ariſing from the bloud which is out of his proper veſſels, which hath fallen down, and will yet flow down. The wound of the Lungs is grown great, and will grow more great, becauſe it is in perpetual motion both ſleeping and waking, and is dilated and compreſt to let the air to the heart, and caſt fuliginous vapours out: by the unnatural heat is made inflammation, then the expulſive virtue is conſtrained to caſt out by cough whatſoever is obnoxious unto it: for the Lungs cannot be purged but by coughing, and by coughing the wound is dilated, and grows greater, from whence the bloud iſſues out with great abundance, which bloud is drawn from the heart by the Vein Arterial to give them nouriſhment, and to the heart by the *Venaena*; his meat was Barley-broth, Stewed Prunes, ſometimes Panado; his drink was Piſan: He could not lye but upon his back, which ſhewed he had a great quantity of bloud

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ſpilt within the capacity of the *Thorax*; and being ſpread or ſpilled along the ſpondyls, doth not ſo much preſs the Lungs as it doth being laid on the ſides or ſitting.

What ſhall I ſay more, but that the ſaid Lord *Martigues* ſince the time he was hurt hath not repoſed one hour onely, and hath always caſt out bloudy Urines and Stools. Theſe things then *Meſſiers* conſidered, one can make no other prognoſtick but that he will die in a few days, which is to my great grief. Having ended my diſcourſe, 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 pulſe and known his forces to be almoſt ſpent and aboliſhed, they concluded with me, that in a few days he 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; he anſwered, it were poſſible if he were well dreſt, he might eſcape: Then they all with one voice ſaid, he had been very well dreſt, and ſollicited with all things neceſſary for the curing of his wounds, and could not be better, and that it was impoſſible to cure him, and that his wound was mortal of neceſſity. The Mounſieur *De Savoy* ſhewed himſelf to be very much diſcontented and wept, and asked them again if for certain they all held him deplored and remedileſs; they anſwered, Yes. Then a certain *Spaniſh* Impoſtor offered himſelf, who promiſed on his life that he would cure him, and if he failed to cure him, they ſhould cut him in an hundred pieces: but he would not have any 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 any wiſe go any more to ſee the ſaid Lord of *Martigues*. And he ſent a Gentleman to me to forbid me upon pain of life not to touch any more the ſaid Lord of *Martigues*, which I promiſed not to do; wherefore I was very glad, ſeeing he ſhould not die in my hands, and commanded the ſaid Impoſtor to dreſs the ſaid Lord of *Martigues*, and that he ſhould have no other Phyſicians nor Surgeons but him; he came preſently to the ſaid Lord of *Martigues*, who told him:

Senor Cavallero el ſenor Duge me ha mandado que veniaſſe a curar vaſtra herida, yo os juro a Dios que antes de achio dias yo os hag a ſubir a Cavallo con la lanſa en puno contaſque no ago que yo quos togne, Comerit y biberis todis comedas que ſueren de vaſtro guſto y yo hare la dieta pro V. M. y deſto os de ven aſeguirar ſobre de mi, yo be ſanado muns hos que tenian magores heridas que la vaſtra. That is to ſay, Lord Cavallier, Mounſieur the Duke of *Savoy* hath commanded me to come dreſs thy wound; I ſwear to thee by God, that before eight days I will make thee mount on Horſe-back with thy Lance in thy hand, provided that no man may touch thee but my ſelf; thou ſhalt eat and drink any thing that thou haſt a mind to, I will perform thy diet for thee, and of this thou mayeſt be aſſured upon my promiſe. I have cured divers who have had greater wounds than thine: and the Lord replied, *God give you Grace to do it.*

He demanded of the ſaid Lord a Shirt, and tore it in little rags, which he put acroſs, muttering and murmuring certain words over the wounds; and having dreſt him, permitted him to eat and drink what he would, telling him he would obſerve a diet for him, which he did, eating but ſix Prunes and ſix bits of bread at a meal, and drinking but Beer. Notwithſtanding two days after, the ſaid Lord of *Martigues* died; and my *Spaniard*, ſeeing of him in the Agony, eclipſed himſelf, and got away without bidding farewel to any body; and I believe if he had been taken, he had been hanged for his falſe promiſes, which he had made to Mounſieur the Duke of *Savoy*, and to divers other Gentlemen.

He died about ten of the Clock in the morning, and after Dinner the ſaid Lord of *Savoy* ſent Phyſicians and Surgeons, and his Apothecary, with a great quantity of Drugs to embalm him; they came accompanied with divers Gentlemen and Captains of the Army.

The Emperours Surgeon came near to me, and prayed me kindly to open the Body; which I refuſed, telling him I was not worthy to carry his Plaſter-Box after him. He prayed me again; which then I did for his ſake, if it ſo liked him. I would yet again have excuſed my ſelf, that ſeeing he was not willing to embalm him, that he would give this charge to another Surgeon of the Company; he made me yet anſwer, that he would it ſhould be I; and if I would not do it, I might hereafter repent it. Knowing this his affection, for fear he ſhould do me any diſpleaſure, I took the Razor and preſented it to all in particular, telling them I was not well practiſed to do ſuch Operations, which they all refuſed.

The Body being placed upon a Table, truly I purpoſed to ſhew them that I was an Anatomiſt, declaring to them divers things ſhould be here too long to recite. I began to tell all the Company that I was ſure the bullet had broken two Ribs, and that it had paſſed through the Lungs, and that they ſhould find the wound much enlarged, becauſe they are in perpetual motion, ſleeping or waking, and by this motion the wound was the more dilacerated. Alſo that there was great quantity of bloud ſpilt in the capacity 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 body.

One of the Phyſicians asked me, which way the bloud might paſs to be caſt out by Urine, being contained in the *Thorax*. I anſwered him that there was a manifeſt Conduit, which is the *Vena Azygos*, which having nouriſhed the ribs, the reſt of the bloud deſcends under the Diaphragm, and on the left ſide is conjoined to the emulgent Vein, which is the way by which the matter in Pleuriſies and in *Empiema*, do manifeſtly empty themſelves by Urin and Stool. As it is likewiſe ſeen the pure milk of the breſts of Women newly brought to bed, to deſcend by the Mammillary veins and to be evacuated downwards by the neck of the womb without being mixt with the bloud. And ſuch a thing is done (as it were by a miracle of Nature) by her expulſive and ſequeſtring virtue, which is ſeen by experience of two glaſs veſſels called Mount-wine; let the one be filled with Water, and the other with Claret-wine, and let them be put the one upon the other, that is to ſay, that which ſhall be filled with Water upon that which ſhall be filled with Wine, and you ſhall apparently ſee the Wine

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mount up to the top of the veſſel quite through the water, and the water deſcend atraverſe the wine, and go to the bottom of the veſſel without mixture of both; and if ſuch a thing be done ſo exteriorly and openly to the ſenſe of our eye, by things without life, you muſt believe the ſame in our underſtanding; That nature can make matter and bloud to paſs, having been out of their veſſels, yea, through the bones, without being mingled with the good bloud.

Our diſcourſe ended, I embalmed the body, and put it into a Coffin; after that the Emperors Surgeon took me apart, and told me if I would remain with him, that he would uſe me very well, and that he would cloath me a new, alſo that I ſhould ride on Horſe-back. I thanked him very kindly for the honour he did me, and told him that I had no deſire to do ſervice to Strangers and Enemies to my Countrey: then he told me I was a Fool, and if he were Priſoner as I, he would ſerve the Devil to get his liberty. In the end I told him flat that I would not dwell at all with him.

The Emperours Phyſician returned towards the ſaid Lord of *Savoy*, where he declared the cauſe 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 done what was neceſſary to be done, and prayed him to win me to his ſervice, and ſpake better of me than I deſerved.

Having been perſuaded to take me to his ſervice, he gave charge to one of his Stewards named Mounſieur *de Bouchet*, to tell me if I would dwell in his ſervice, that he would uſe me kindly: I anſwered him that I thanked him moſt humbly, and that I had reſolved not to dwell with any Stranger. This my anſwer being heard by the Duke of *Savoy*, he was ſomewhat in choler, and ſaid, He would ſend me to the Gallies.

Mounſieur *de Vandeville* Governor of *Gravelin*, and Colonel of the ſeventeen Enſigns of Foot, prayed him to give me to him, to dreſs him of an ulcer which he had in his leg this ſix or ſeven years; Mounſieur *de Savoy* told him, becauſe I was of worth, that he was content, and if I rankled his leg, it would be well done; he anſwered, that if he perceived any thing, he would cauſe my Throat to be cut.

Soon after the ſaid Lord of *Vandeville* ſent for me by four *German* Halbertiers, which affrighted me much, not knowing whither they led me, they ſpake no more French than I High Dutch: being arrived at his Lodging, he told me I was welcome, and that I was his; and as ſoon as I ſhould have cured him of that ulcer in his leg, that he would give me leave to be gone without taking any ranſom of me. I told him that I was not able to pay any ranſome.

Then he made his Phyſician and Surgeon in Ordinary to ſhew me his ulcerated leg; having ſeen and conſidered it, we went apart into a Chamber, where I began to tell them that the ſaid Ulcer was annual, not being ſimple but complicated: that is of a round figure and ſcaly, having the lips hard and callous, hollow and ſordid, accompanied with a great varicous vein which did perpetually feed it; beſides a great tumour, and a phlegmonous diſtemper very painful through the whole leg, in a body of cholerick complexion, as the hair of his face and beard demonſtrated. The method to cure it (if cured it could be) was to begin with univerſal things, that is, with Purgation and Bleeding, and with this order of Diet, that he ſhould not uſe any Wine at all, nor any ſalt Meats or of great nouriſhment, chiefly thoſe which did heat the bloud: 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 will very hardly cure, as the Ancients have left it in writing, which is ſeen by experience. That done the filth muſt be mundified, as alſo the corrupt fleſh, which ſhould be done with *Unguentum Ægyptiacum*, and upon it a bolſter dipt in juice of Plantain and Nightſhade and *Oxycrate*, and rowl 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 flow to the Ulcer. Moreover that he ſhould take reſt in his bed, which is commanded by *Hippocrates*, who ſaith, that thoſe who have ſore legs ſhould not uſe much ſtanding or ſitting, but lying along. And after thoſe things be done, and the Ulcer well mundified, a plate of Lead rubbed with Quickſilver ſhould be applied. See then the means by which the ſaid Lord *Vandeville* might be cured of the ſaid Ulcer; all which they found good. Then the Phyſician left me with the Surgeon, and went to the Lord *Vandeville*, to tell him that he did aſſure him I would cure him, and told him what I was reſolved to do for the cure of his Ulcer, wherefore he was very joyful. He made me to be called to him, and asked me if I was of the opinion that this Ulcer could be cured, and I told him, yes, provided he would be obedient to what he ought. He made me a promiſe he would perform all things which I would appoint; and as ſoon as his Ulcer ſhould be cured, he would give me liberty to return without paying any ranſom. Then I beſeeched him to come to a better compoſition with me, telling him that the time would be too long to be out of liberty, if I ſtaid till he was perfectly well; and that I hoped within fifteen days the Ulcer ſhould be diminiſhed more than one half, and it ſhould be without pain, and that his Phyſicians and Surgeons would finiſh the reſt of the cure very eaſily. To which he agreed, 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 prayed him to keep promiſe, when he ſhould find his buſineſs done: He ſwore by the faith of a Gentleman he would do 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 day, and he found that very ſtrange. And likewiſe his Phyſician, which was but a Freſh-man in thoſe affairs, who would perſuade me with the Patient, to dreſs him two or three times a day, I prayed him to let me do what I thought good; and that it was not to prolong the cure, but on the contrary to haſten it, for the great deſire I had to be in liberty. And that he would look in *Galen* in the fourth Book of the Compoſition of Medicaments *ſecundum genera*, who ſaith, that if a Medicin do not remain long upon the part it profits not ſo much as when it doth continue long; a thing which many 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 themſelves accuſe often-times the Surgeons of negligence, becauſe they do not often-

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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 ſomething, where one of them is much ſtronger than the other, by means whereof the ſaid qualities are united; they familiarize with the time, although they are much differing from the manner, that the quality of the Medicament doth unite, and ſometimes becomes like to that of the body, which is a very profitable thing. Therefore they ſay he is to be praiſed much who firſt invented not to change the Plaſter ſo often, becauſe 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 takes not away onely the unprofitable excrement, which is the *pus* or *ſanies* of the ulcer, but the matter whereof the fleſh is engendered; wherefore for the reaſons aforeſaid it is not needful to dreſs Ulcers ſo often.

The ſaid Lord *Vandeville* would ſee whether that which I alledged out of *Galen* were true and commanded the ſaid Phyſician to look there, for that he would know it; he cauſed the Book to be brought upon the Table, where my ſaying was found true, and then the Phyſician was aſhamed, and I very joyful. So that the ſaid Lord of *Vandeville* deſired not to be dreſſed but once a day, in ſo much that within fifteen days the Ulcer was almoſt cicatrized; the compoſition being made between us, I began to be merry. He made me eat and drink at his Table, when there were not men of more great rank with him.

He gave me a great red Scarf, which he commanded me to wear. I may ſay I was as glad of it as a Dog that hath a clog, for fear he ſhould go into the Vineyard and eat the Grapes. The Phyſician and Surgeon led me 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 twenty five or thirty pieces for the Field.

Mounſieur *de Vandeville* held Mounſieur *de Bauge* Priſoner, the Brother of Mounſieur *de Martigues* who died at *Hedin*. The ſaid Lord of *Bauge* was Priſoner in the Caſtle of the *Heap of Wood*, belonging to the Emperour, who had been taken at *Theroueune* by two *Spaniſh* Souldiers. Now the ſaid Lord of *Vandeville* having looked well upon him, conceived he muſt be a Gentleman of ſome good Houſe; and to be the better aſſured, he cauſed him to have his Stockings pulled off, and ſeeing his Stockings and his Feet clean and neat, together with his fine white ſocks, it confirmed him the better in his opinion, that it was a man was able to pay ſome good ranſom. He demands of the Souldiers if they would take thirty Crowns for their Priſoner, and that he would give it to them preſently, to which they agreed willingly, becauſe they had neither means to keep him, nor feed him: beſides they knew not his worth, therefore they delivered their Priſoner into the hands of the ſaid Lord of *Vandeville*, 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 he was, and endured very much, being kept but with bread and water, and lay upon a little ſtraw. The ſaid Lord of *Vandeville* after 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, Mounſieur *de Martigues:* and when the ſaid Lord of *Bauge* heard the ſound of the death of his brother the Lord *Martigues*, he began much to weep and lament; his Keeper demanded of him, why he made ſo many and ſo great lamentations? He declared unto them that it was for Mounſieur *de Martigues* his brothers ſake. Having underſtood that, the Captain of the Caſtle diſpatched a man away quickly, to tell it to Mounſieur *de Vandeville* that that he had a good priſoner; who having received this good news rejoiced greatly, and the next day ſent me with his Phyſicians and four Souldiers to the Wood-Caſtle to know if this priſoner would give him fifteen thouſand Crowns for a ranſom, ſo he would ſend him free to his own houſe; and for the preſent he deſired but the ſecurity of two Merchants of *Antwerp*, that he would name. The ſaid Lord *Vandeville* perſuaded me that I would make his agreement with his priſoner. See then why he ſent me to the Wooden Caſtle, and commanded the Captain of the Caſtle to uſe him well, and to put him into a Chamber hung with Tapeſtry, 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 he was not able; and that, that depended upon Mounſieur *de Eſtampes* his Uncle, and of Miſtreſs *de Breſſeure* his Aunt, and he had not any means to pay ſuch a ranſom. I returned with my Keepers to the ſaid Lord *Vandeville*, and told him the anſwer of his ſaid Priſoner, who told me perhaps he ſhould not get out at ſo good a rate; which was true, for he was diſcovered. And forthwith the Queen of *Hungary* and the Duke of *Savoy* ſent word to the Lord *Vandeville*, that this morſel was too great for him, and that he muſt ſend him to them, (which he did) and that he had enough Priſoners beſides him. He was put to forty thouſand Crowns ranſom, beſides other expences.

Returning toward the ſaid Lord *Vandeville* I paſſed by St. *Omer*, where I ſaw their great pieces of Battery, whereof the greateſt part was flawed and broken. I came alſo by *Theroueune*, 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 Country people within five or ſix leagues about, that they ſhould empty and carry away the ſtones; in ſo much, that now one may drive a Cart over the City as is likewiſe done at *Hedin*, without any appearance of Caſtle or Fortreſs. See then the miſchief which comes by the Wars.

And to return to my purpoſe, preſently after my ſaid Lord *Vandeville* was very well of his Ulcer, and little wanted of the entire cure, which was the cauſe he gave me my leave, and made me be conducted with a Paſs-port by a Trumpet to *Abbeville*, where I took Poſt, and went and found King *Henry* my Maſter at *Anſimon*, who received me with joy, and a good countenance.

He ſent for the Duke of *Guiſe* the High Conſtable of *France*, and Mounſieur *d' Eſtres*, to underſtand by me 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 Battery, which they had carried to St. *Omer*. Whereof the

the King was very joyful, becauſe he feared leſt the enemy ſhould come further into *France*. He gave me two hundred Crowns to retire my ſelf to my own houſe, and I was very glad to be in liberty, and out of this great torment and noiſe of thunder from the Diabolick artillery, 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 Majeſty cauſed to be written to my wife by Monſieur *de Gognier* his chief Phyſician, and that ſhe ſhould not be in any trouble of mind for me, for that I was ſafe and well, and that he would pay my ranſom.

The Battle of S. Quintin, 1557.

AFter the Battel of S. *Quintin*, the King ſent for me to the Fere in *Tartenois* toward Monſieur the Marſhal of *Bourdillon*, to have a paſs-port by the Duke of *Savoy* to go to dreſs Monſieur the Conſtable, who was grievouſly hurt with a Piſtol-ſhot in the back, whereof he was like to die, and remained a priſoner in his enemies hands. But the Duke of *Savoy* would not give conſent that I ſhould go to the ſaid Lord Conſtable, ſaying, he would not remain without a Surgeon, and that he doubted I was not ſent only to dreſs him, but to give him ſome advertiſement, and that he knew I underſtood ſomething elſe beſide Surgery, and that he knew me to have been his priſoner at *Hedin*. Monſieur the Marſhal of *Bourdillon* advertiſed the King of the Dukes denial, by which means the King writ to the ſaid Lord of *Bourdillon*, that if my Lady, the Lord high Conſtables wife, did ſend any body of her houſe, 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 *Lorrain* had given me in charge. Two days after there arrives 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 very glad thereof, and gave him my letter, and gave him his leſſon, of that which his Maſter ſhould do being priſoner. I had thought being diſcharged of my embaſſage to return toward the King. But the ſaid Lord of *Bourdillon* prayed me to ſtay with him at the Fere to dreſs a great number of people who were hurt, and were thither retired after the battle; and that he would ſend word to the King the cauſe of my ſtay; which I did. The wounds of the hurt people were greatly ſtinking, and full of worms with gangrene and putrefaction; ſo that I was conſtrained to come with my knife to amputate that which was ſpoiled, which was not without cutting off arms and legs, as alſo to trepan divers. Now there were not any medicines to be had at the Fere, becauſe the Surgeons of our Camp had carried all with them; I found out that the Chariot of the Artillery tarried behind at the Fere, nor had it yet been touched. I prayed the Lord Marſhal that he would cauſe ſome of the drugs to be delivered to me that were in it; which he did, and there was given to me one half at a time: five or ſix days after I was conſtrained to take the reſt, neither was there half enough to dreſs ſo great a number of people, and to contract and ſtay the putrefaction, 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, very many of them died.

There were Gentlemen at the Fere who had charge to find out the dead body of Monſier *de Bois-Dolphin* the Elder, who had been ſlain in the battle; they prayed me to accompany them to the Camp to find him out amongſt the dead, if it were poſſible, which indeed was impoſſible; ſeeing that the bodies were all diſfavoured and overwhelmed with putrefaction. We ſaw more than half a league about us the earth covered with dead bodies, neither could we abide long there, for the cadaverous ſents which did ariſe from the dead bodies, as well of men as of Horſes. And I think we were the cauſe, that ſo great a number of flies roſe from the dead bodies, which were procreated by their humidity and the heat of the Sun, having their tails green and blew, that being up in the air made a ſhadow in the Sun. We heard them buz, or hum, which was much marvel to us. And I think it was enough to cauſe 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 being cloyed and annoyed in that Country, I prayed Monſieur the Lord Marſhal, to give me my leave to be gone, and that I was afraid I ſhould be ſick by reaſon of my too great pains, and the ſtinks which did ariſe from the wounded, which did almoſt all die, for what diligence ſoever could be uſed unto them. He made other Surgeons come finiſh the dreſſing of the ſaid hurt people, and I went away with his good grace and favour. He wrote a letter to the King, of the pains he had taken of the poor wounded. Then I returned to *Paris*, where I found yet many Gentlemen that had been hurt, and were there retired after the battle.

The Voyage of the Camp of Amiens, 1558.

THE King ſent me to *Dourlan*, and made me be conducted by a Captain *Gouſt*, with fifty men in Arms, for fear I ſhould be taken by the enemies. And ſeeing that in the way we were always in alarums, I cauſed my man to alight, making him to be my maſter for that time, and I got upon his horſe, which carried my mail, and took his cloak and hat, and gave him my ambling Mare. My man being 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 we were enemies, and let flie their Cannon-ſhot at us. Captain *Gouſt* my conductor, made a ſign with his hat, that we were not enemies, ſo that they left ſhooting, and we entred into *Dourlan*, with great joy. Thoſe of *Dourlan* made a ſally forth upon the enemies five or ſix days before; who killed and hurt divers of our Captains, and good Souldiers; and amongſt the reſt Captain S. *Aubin* valiant at the ſword, whom Monſieur *de Guiſe* loved very well, and for whom chiefly the King ſent me thither, who being in the fit of a quartan fever, would needs go out to command the greateſt part of his Company: a *Spaniard* ſeeing him that he commanded, perceived he was a Captain, and ſhot a muſket-bullet quite through his neck; my Captain S. *Aubin* thought with this ſtroke he was dead,

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and with the fear (I protest to God) he lost his quartan ague, and was altogether freed from it. I dressed him with *Anthony Portal* Surgeon in ordinary to the King, and divers other souldiers: some died, others escaped quite with the loss of a leg, or an arm, or the loss of an eye, and they said they escaped good cheap, escape that can. When the enemy had broken their Camp, I returned to *Paris*. Here I hold my peace of my little Master, who was more at ease in his house, than I at the Wars.

The Voyage of Harbor *of Grace*, 1563.

YEt I will not omit to speak of the Voyage of the *Harbor* of Grace; then when they made the approaches to plant the Artillery, the English who were within it killed some of our Souldiers, and divers Pioneers, who undermined, who when they were seen to be so hurt that there was no hope of curing, their fellows stript them and put them yet alive into the Mines, which served them for so much filling earth. The English seeing they could not withstand an assault, because they were very much attainted with diseases, and chiefly with the Plague, they yielded, their lives and jewels saved. The King caused them to have ships to return to *England*, being glad to be out of this place infected with the Plague: the greatest part died, and carried 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 very joyful to enter therein, hoping there to make to make good cheer. My little Master had you been there, you had done as they.

The Voyage of Rowen, 1562.

NOw for the taking of *Rowen*, they killed divers of ours before the assault, and at the assault: the day after they entred into the City, I trepaned eight or nine, who were hurt at the breach with the strokes of stones. There was so malignant an air, that divers died, yea of very small hurts, insomuch that some thought they had poisoned their bullets: those within said the like by us, for although they were well treated in their necessities within the City, yet they died also as well as those without. The King of *Navar* was hurt in the shoulder with a bullet some few days before the assault; I visited and helpt to dress him, with his own Surgeon, named M. *Gilbert* one of the chief of *Montpelier*, and others. They could not find the bullet, I searched for it very exactly; I perceived by conjecture, that it was entred by the head of the *Adjutorium*, and that it had run into the cavity of the said bone, which was the cause we could not find it. The most part of them said it was entred and lost within the cavity of the body. Monsieur the Prince of the *Roch upon Yon*, who intimately loved the King of *Navar*, drew me to one side, and askt me if the wound was mortal. I told him yea, because all wounds made in great joints, and principally contused wounds, were mortal according to all Authors who had written of them. He inquired of the others what they thought, and chiefly of the said *Gilbert*, who told him that he had great hope that the King his Master would be cured, and the said Prince was very joyful. Four days after the King and Queen-Mother, Monsieur the Cardinal of *Bourbon* his brother, Monsieur the Prince of *Roch upon Yon*, Monsieur *de Guise*, and other great personages, after we had dressed the King of *Navar*, caused a consultation to be made in their presences, where there were divers Physicians and Surgeons: each man said what seemed good unto him, and there was not one of them, who had not good hope of him, saying that the King would be cured, and I persisted always on the contrary.

Monsieur the Prince of the *Roch upon Yon* who loved me, withdrew me aside, and said I was only against the opinion of all the rest, and prayed me not to be obstinate against so many worthy men. I answered him, that when I saw any good signs of cure, I would change my advice. Divers consultations were made, where I never changed my word, and prognostick, such as I had made at the first dressing, and always said that the arm would fall into a Gangrene, which it did, what diligence soever could be had to the contrary; and he gave up his soul to God the eighteenth day of his hurt, Monsieur the Prince *upon Yon*, having heard the death of the said King, sent his Physician and Surgeon toward me, named *Feure* now in ordinary to the King, and the Queen-Mother, to tell me, that he would have the bullet taken out, and that it should be lookt for in what place soever it could be found: then I was very joyful, and told them that I was well assured to find it quickly, which I did in their presences and divers Gentlemen. It was lodged in the very midst of the cavity of the Adjutory bone. My said Prince having it, shewed it to the King and Queen, who all said my prognostick was found true. The body was laid to rest in the Castle-Galliard, and I returned to *Paris*, where I found divers hurt men who were hurt at the breach of *Rowen*, and chiefly *Italians*, who desired me very much to dress them, which I did willingly; there were divers that recovered, and others died. I believe (my little Master) you were called to dress some of them, for the great number there was of them.

The Voyage of the Battel of Dreux, 1592.

THe day after the battel was given at *Dreux*, the King commanded me, 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 day 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 twenty thousand men and more. All which were dispatched 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 scholers, and to your children. Now in the mean time while I was at *Dreux* I visited and dresst a great number of Gentlemen and poor souldiers, and amongst the rest many *Swisses* Captains; I dressed fourteen in one chamber only, all hurt with Pistol-shot and other instruments of diabolical fire, and not one of the fourteen died. Monsieur the Count of *Eu* being dead, I made no long tarrying at *Dreux*: there came Surgeons from *Paris* who perform-

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med well their duty towards the hurt people, as *Pigray*, *Cointeret*, *Hubert*, and others; and I returned to *Paris*, where I found divers Gentlemen wounded, who had retired themselves thither after the Battle to be dressed of their hurts.

The Voyage of the Battle of Moncontour, 1596.

DUring the Battle of *Moncontour*, King *Charles* was at *Plessis* the *Tours*; where he heard they had won it; a great number of hurt Gentlemen and Souldiers withdrew themselves into the City and Suburbs of *Tours*, to be dressed and helped, where the King and Queen-Mother commanded me to shew my duty with the other Surgeons, who were then in quarter, as *Pigray*, *du Blois*, *Portail*, and one named *Siret*, a Surgeon of *Tours*, a man very skilful in Surgery, and at that time Surgeon to the Kings Brother; and for the multitude of the wounded we were but little in repose, nor the Physicians likewise. Count *Mansfield* Governour of the Duchy of *Luxemburg*, Knight of the King of *Spains* Order, was greatly hurt in the battle, in the left arm, with a Pistol-shot, which broke a great part of the joint of the elbow, and had retired himself to *Bourgueille* near *Towers*; being there, he sent a Gentleman to the King, affectionately to beseech him to send one of his Surgeons to help him in his hurt. Council was held what Surgeon should be sent. Mounsieur the Marshal of *Montmorency* told the King and Queen, that it were best to send his chief Surgeon, and declared to him that the said Lord *Mansfield* was one part of the cause of winning the Battle. The King said flat he would not that I should go, but would have me remain close to him. Then the Queen-Mother said, I should but go and come, and that he must consider it was a strange Lord, who was come from the King of *Spains* side, to help and succour him. And upon this he permitted me to go, provided that I should return quickly. After this resolution he sent for me, and likewise the Queen-Mother, and commanded me to go find the said Lord *Mansfield* in the place, where I was to serve him in all I could, for the cure of his hurt; I went and found him, having with me a Letter from their Majesties: having seen it, he received me with a good will, and from thenceforth discharged three other Surgeons that dresst him; which was to my great grief, because his hurt seemed to me uncurable. Now at *Bourgueil* there were retired divers Gentlemen, who had been hurt at the said Battle, knowing that Mounsieur *de Guise* was there, who had been also very much hurt with a Pistol-shot through one leg, well assured that he would have good Surgeons to dress him, and also that he, being kind and liberal, would assist them with a great part of their necessaries. And for my part, I did help and aid them with all my Art, as much as it was possible; some died, some recovered, according to their hurts. The Count *Rhingrave* died, who had such a shot into the shoulder, as the King of *Navar* before *Rouen*. Mounsieur *de Bassompiere* Colonel of twelve hundred Horse, was hurt also in such a like place as Count *Mansfield*, whom I dresst and God cured. God so blessed my work that within three Weeks I led him back to *Paris*, where I must as yet make some incisions in the arm of the said Lord *Mansfield*, to draw out the bones which were greatly broken and carieted: he was cured by the grace of God, and gave me an honest reward, so that I was well contented with him, and he with me, as he hath since made it appear: He writ a Letter to the Duke of *Ascot* how that he was cured of his hurt, and also Mounsieur *de Bassompiere* of his, and divers others, which I had dresst after the Battle of *Moncontour*, and counselled him to beseech the King of *France*, my good Master, to give me leave to go see Mounsieur the Marquess of *Auret* his Brother.

The Voyage of Flanders.

MOunsieur the Duke of *Ascot* did not fail to send a Gentleman to the King with a Letter, humbly to beseech him to do him so much good and honour, as to permit and command his chief Surgeon to come to see the Marquess of *Auret* his Brother, who had received a Musket-shot near the Knee, with fracture of the bone, about seven moneths since, which the Physicians and Surgeons in those parts were much troubled to cure. The King sent for me, and commanded me 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 would imploy all that little knowledge which it hath pleased God to give me. I went then conducted by two Gentlemen of the Castle of *Auret*, which is a league and a half from *Mons* in *Hainault*, where the said Marquess was: as soon as I arrived I visited him, and told him the King had commanded me to come and see him, and to dress him of his hurt; he told me he was glad of my coming, and was much bound to the King to have done him the honour to have sent me to him. I found him in a great Fever, his eyes very much sunk, with a countenance gastly and yellow, his tongue drie and rough, and all the body 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 searched it with a Probe, and by the same I found a cavity near the groin, ending in the middle of the thigh, and others about the knee, sanious and cuniculous; also certain scales of bones, some separated, others not. The legs were much tumified, and soked with a pituitous humour, cold, moist, and flatulent; in so much that the natural heat was in the way to be suffocated and extinguished, and the said leg crooked and extracted toward the buttocks, his rump ulcerated the bredth of the palm of an hand, and he said he felt there a great pain and smarting, and likewise in his reins, in so much that he could not take any rest night or day; neither had he any appetite to eat, but to drink enough: it was told me that he fell often into faintings and swoonings, and sometimes as it were by an Epilepsie, and had oftentimes desired to vomit, with such a trembling that he could not carry his hands to his mouth. Seeing and considering all these great accidents, and the forces much abated; truly I was much grieved to have gone to him, because me thought there was little appearance that he could escape. Notwithstanding to give him good courage and good hope, I told him that I would quickly see him on foot by the grace of God, and the Physicians and Surgeons help. Having seen him, I went a wal-

a walking into a Garden, where I prayed to God that he would give me the grace to cure him, and that he would give a bleſſing to our Hands and Medicaments, to combat againſt ſo many complicated Maladies. I bethought in my mind the ways I muſt keep to do it. They called me to dinner, I entered 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, we entered into conference in the preſence of Mounſieur the Duke of *Aſcot*, and ſome Gentlemen that did accompany him; I began to tell the Surgeons that I marvelled much they had made no apertions in the Marqueſſes 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 found with my Probe a *Caries* in the bone, and ſmall ſcales which were already ſeparated; they made me anſwer, He would never give conſent, and likewiſe it was almoſt two Moneths ſince they could win him to put on clean Sheets on his bed, neither durſt any one ſcarce touch the Coverlet, he felt ſo great pain. Then ſaid I, for to cure him, we muſt touch other things than the Coverlet of the Bed. Each one ſaid what he thought beſt for the Lords grief, and for concluſion held it altogether deplorable. I told them there was yet ſome hope, becauſe of his youth, and that God and Nature do ſometime ſuch things which ſeem to Phyſicians and Chirurgeons impoſſible. My conſultation was, that all thoſe accidents were come by reaſon of the bullet hitting near the joint of the Knee, which had broken the ligaments, tendons, and *aponeuroſes* of the muſcles which tied the ſaid joint together with the *Os femoris*; alſo Nerves, Veins, and Arteries, from whence had followed pain, inflammation, apoſtume, and ulcer: and that we muſt begin the cure by the diſeaſe, which was the cauſe of all the ſaid accidents, that is to ſay, to make apertions, to give iſſue to the matter retained in the interſpaces of the Muſcles, and in the ſubſtance of them: Likewiſe to the bones which cauſed a great corruption in the whole thigh, from whence the vapours did ariſe and were carried to the heart, which cauſed the Syncope and the Fever, and the Fever an univerſal heat through the whole body; and by conſequent, depravation of the whole *Oeconomy*; Likewiſe that the ſaid vapours were communicated to the brain, which cauſed the Epilepſie and trembling, and to the Stomach diſdain and loathing, and hindered it from doing its functions, which are chiefly to concoct and digeſt the meat, and to convert it into *Chylus*; which not being concocted, they ingender crudities and obſtructions, which makes that the parts are not nouriſhed, and by conſequent the body dries, and grows lean, and becauſe alſo it did not do any exerciſe; for every part which hath not his motion remaineth languid and *atrophiated*, becauſe the heat and ſpirits are not ſent or drawn thither, from whence follows mortification. And to nouriſh and fatten the body, Fricktions muſt be made univerſally through the whole body with warm linnen cloths above, below, and on the right ſide, and left, and round about; to the end to draw the blood and ſpirits from within outward, and to reſolve any fuliginous vapours retained between the skin and the fleſh; thereby the parts ſhall be nouriſhed and reſtored, (as I have heretofore ſaid, in the Tenth Book treating of the Wounds of Gunſhot) and we muſt then ceaſe when we ſee heat and redneſs in the skin, for fear of reſolving that we have already drawn, and by conſequent make it become more lean. As for the ulcer which he hath upon his rump, which came through his too long lying upon it without being removed, which was the cauſe that the ſpirits could not flouriſh or ſhine in it, by the means of which there ſhould be inflammation, apoſteme, and then ulcer, yea with loſs of ſubſtance of the ſubject fleſh, with a very great pain, becauſe of the Nerves which are diſſeminated in this part: That we muſt likewiſe put him in another ſoft bed, and give him a clean Shirt and Sheets; otherwiſe all that we could do would ſerve for nothing, becauſe that thoſe excrements and vapours of the matter retained ſo long in his bed, are drawn in by the *Syſtole* and *Diaſtole* of the Arteries which are diſſeminated through the skin, and cauſe the ſpirits to change and acquire an ill quality and corruption which is ſeen in ſome that lie in a bed where one hath ſwet for the Pox, who will get the Pox by the putrid vapours which ſhall remain ſoaking in the Sheets and Coverlets. Now the cauſe why he could in no wiſe ſleep, and was as it were in a Conſumption, 'twas becauſe he ate little, and did not do any exerciſe, and becauſe he was grieved with extreme pain. For there is nothing that abateth ſo much the ſtrength as pain. The cauſe why his tongue was dry and foul, was through the vehemency of the heat of the Fever, by the vapors which aſcended through the whole body to the mouth. For as we ſay in a common Proverb, *When the Oven is well heat, the Throat feels it.* Having diſcourſed of the Cauſes and Accidents, I ſaid they muſt be cured by their Contraries, and firſt we muſt appeaſe the pain, making apertions in the thigh to evacuate the matter retained, not evacuating all at a time, for fear left by a ſudden great evacuation, there might happen a great decay of ſpirits which might much weaken the Patient and ſhorten his days. Secondly, to look to the great ſwelling and cold of his leg, fearing left it ſhould fall into a Gangrene and that actual heat muſt be applied unto him, becauſe the potential could not reduce the intemperature *De Potentia ad Actum*; for this cauſe hot Bricks muſt be applied round about, on which ſhould be caſt a decoction of Nerval Herbs boiled in Wine and Vinegar, then wrapt up in ſome Napkin, and to the feet an earthen Bottle filled with the ſaid decoction, ſtopt and wrapped up with ſome linen cloths; alſo that fomentations muſt be made upon the thigh, and the whole leg, of a decoction made of Sage, Roſemary, Tyme, Lavender, Flowers of Cammomile, Melilot, and Red Roſes boiled in White Wine, and a *Lixivium* made with Oak-aſhes, with a little Vinegar, and half an handful of Salt. This Decoction hath vertue to attenuate, inciſe, reſolve and drie the groſs viſcous humour. The ſaid Fomentations muſt be uſed a long while, to the end there may be a great reſolution; for being ſo done a long time together, more is reſolved than attracted, becauſe the humour contained in the part is liquified, the skin and the fleſh of the muſcles is rarified. Thirdly, that there muſt be applied upon the rump a great Plaſter made of the red deſiccative,

cative and *Unguentum Comitiſſæ*, of each equal parts incorporated together, to the end to appeaſe his pain, and drie up the ulcer, alſo to make him a little down-pillow which might bear his rump aloft without leaning upon it. Fourthly, to refreſh the heat of his Kidnies, one ſhould apply the Unguent called *Refrigerans Galeni* freſhly made, and upon the leaves of Water-Lillies. Then a Napkin dipt in *Oxycrate*, wrung and often renewed, and for the corroboration and ſtrengthening of his heart a refreſhing Medicin ſhould be applied, made with Oil of *Nenuphar*, and unguent of Roſes, and a little Saffron diſtilled in Roſe-Vinegar, and Treacle ſpread upon a piece of Scarlet, for the *Syncope* which proceeded from the debilitation of the natural ſtrength troubling the brain. Alſo he 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 already ſpoken) with the white fleſhy parts of Capons, and Partridge wings minced ſmall, and other roaſt-meat eaſie of digeſtion, as Veal, Goat, Pigeon, Partridge, and the like. The Sauce ſhould be Oranges, Verjuice, Sorrel, ſharp Pomgranats; and that he ſhould likewiſe eat of them boiled with good herbs, as Sorrel, Lettuce, Purſlain, Succory, Bugloſs, Marigolds, and other the like. At night he might uſe cleanſed Barley with the 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 remedy nouriſhing and medicinal, which will provoke him to ſleep: that his bread ſhould be of Meſſlin, neither too new nor too ſtale; and for the great pain of his head, his hair muſt be cut, and rub his head with *Oxyrrhodinum* luke-warm, and leave a double cloth wet therein upon it; likewiſe ſhould be made for him a frontal of Oil of Roſes, Nenuphar, Poppies, and a little Opium and Roſe Vinegar, and a little Camphire and to renew it ſometimes. Moreover one ſhould cauſe him to ſmell to the flowers of Henbane and Nenuphar bruiſed with Vinegar, Roſe Water, and a little Camphire wrapped in a Handkerchief, which ſhall be often and a long time held to his noſe, to the end that the ſmell may be communicated to the brain, and theſe things to be continued till that the great inflammation and pain be paſt, for fear of cooling the brain too much. Beſides, one may cauſe it to rain artificially, in pouring down from ſome high place into a Kettle, and that it may make ſuch a noiſe that the Patient may hear it; by theſe means ſleep ſhall be provoked on him. And as for the retraction of his leg that there was hope to dreſs it, when evacuation was made of the matter, and other humours contained in the thigh, which by their extention (made by repletion) have drawn back the leg, which might be remedied in rubbing the whole joint of the Knee with *Unguentum Dialthææ* and Oil of Lillies, and a little *Aqua vitæ*, and upon it to be laid black Wool with the greaſe thereof. Likewiſe putting in the Ham a Feather pillow folded in double, and by little and little to make his leg to ſtretch out. All which my diſcourſe was approved of by the Phyſicians and Chirurgeons. The conſultation ended, we went to the ſick Patient, and I made him three apertions in his thigh, from whence iſſued out great quantity of matter and ſanies; and at the ſame time I drew out ſome 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 I cauſed a Bed to be made near his own, where there were clean white ſheets, then a ſtrong man lifted him into it, and he rejoiced much in that he was taken out of his foul ſtinking Bed. Soon after he demanded to ſleep, which he did almoſt four hours, where all the people of the houſe began to rejoice, chiefly Mounſieur the Duke of *Aſcot* his Brother.

The days following I made injections into the bottom of the cavities of the Ulcer, made with *Ægyptiacum* diſſolved ſometimes in *aqua vitæ*, and ſometimes in Wine. I applied to mundifie and drie the ſpongy and looſe 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 dexterity, that he had no pain, which being appeaſed, the Fever began much to diminiſh. Then I made him drink Wine moderately allayed with Water, knowing that it reſtores and quickens the ſpirits: and all the things which were reſted on in the conſultation were accompliſhed, according to time and order; and his Pains and Fever ceaſed, he began to grow better, and diſcharged two of his Surgeons and one of his Phyſicians, ſo that we were but three with him. Now I remained there about two moneths, which was not without ſeeing divers ſick people, as well rich as poor, which came to me about three or four leagues about. They gave meat and drink to the needy, all which he recommended to me, and prayed me alſo for his ſake to help them. I proteſt I did not refuſe any one, and did to them what I poſſibly could, wherefore he was joyful. Then when I ſaw he began to mend, I told him he muſt have a Conſort of Violins and a Jeſter to make him merry, which he did: in one moneth we ſo wrought, that he could hold himſelf up in a Chair, and made himſelf to be carried and walk in his Garden, and at the Gate of his Caſtle to ſee the people paſs by. The Country people of two or three leagues about, knowing they could ſee him, came the Feaſt-day Male and Female, to ſing and dance pell mell, in joy of his amendment, all being very glad to ſee him, which was not done without good laughing and drinking. He cauſed ſtill a barrel of Beer to be given them, and they drank all merrily to his good health. And the Citizens of *Mons Hainault*, and other Gentlemen neighbors, came to ſee him in admiration, as a man coming from the Tomb. And as ſoon as he began to mend, he was not without company, and as one went out another came in to viſit him: his Table was always well covered. He was greatly loved of the Nobility and of the Common People, as well for his liberality, as for his beauty and honeſty, having a pleaſant look and a gracious ſpeech, in ſo much that thoſe that beheld his face were conſtrained to love him. The chief of the City of *Mons* came on Saturday to beſeech him to permit me to go to *Mons*, where they had a great deſire to feaſt and make me good cheer for his ſake. He told them he would pray me to go there, which he did. But I made him anſwer that they ſhould not do me ſuch honour, as alſo that they could not give me better cheer than I had with him. And he prayed me again affectionately to go thither, and that I ſhould do that for his ſake, to which I agreed. The day

after they fetcht me with two Coaches, and being arrived at *Mons* we found the dinner ready, and the chief of the City with their Wives, ſtaid for me with a good will. We went to the Table, and they placed me at the upper end, and drank all to me, and to the health of Mounſieur *D' Auret*, ſaying that he was very happy, and they likewiſe, to have obtained me to take him in hand, for that they knew that in this company he was greatly honoured and loved. After Dinner they led me back to the Caſtle of *Auret*, where Mounſieur the Marqueſs ſtaid for me with great expectation to recount unto him, what we had done in our Banquet. I told him that all the company had drank divers times to his health. In ſix weeks he began to uphold himſelf a little with Crutches, and grow very fat, and to get a lively natural colour. Now he had a deſire to go to *Beaumont*, which is the dwelling place of Mounſieur the Duke of *Aſcot*, and made himſelf be carried in a great chair with eight men by turns, and the Country-folks where we paſſed along, knowing 'twas Mounſieur the Marqueſs, fought and ſtrove together who ſhould carry him, and conſtrained us to drink, but it was but Beer, but I believe had it been Wine or Hippocras, they would have given it us with a very good will, ſo much did they ſhew themſelves joyful to ſee the ſaid Marqueſs, and prayed all to God for him. Being arrived at *Beaumont*, all the people came before us to do him reverence, and prayed God to bleſs him, and keep him in good health. We entered into the Caſtle, where there was more than fifty Gentlemen which the Duke of *Aſcot* had ſent for to come make good cheer with his Brother, who kept his Table furniſhed three days together: And after Dinner the Gentlemen ran at the Ring, played at Foils, and rejoiced to ſee Mounſieur *Auret*, becauſe they heard he would never come out of his Bed again, or be cured of his hurt. I was always at the upper end of the Table, where every one drank carouſes to him and me, thinking to make me foxt, which they could not do, for I drank but according to my old cuſtom. A few days after we returned back and took leave of Madam the Dutcheſs of *Aſcot*, who took a Diamond Ring from her finger, which ſhe gave me, acknowledging I had very well dreſt her Brother; which Diamond was better worth than fifty Crowns. Mounſieur *Auret* grew better and better, and walked all alone round about his Garden with Crutches. I begged leave of him divers times to come away 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 prayed him to give me leave to go ſee the City of *Antwerp*, which he willingly accorded to: and commanded his Steward to conduct me thither accompanied with two Pages: we paſſed through *Malines* and *Bruxels*, where the chief of the City prayed the ſaid Steward that at our return they might hear of it, and they had a great deſire to feaſt me, as they of *Mons* had done. I thanked them moſt kindly, and told them that I was not worthy of ſuch honour. I was not two days and a half to ſee the City of *Antwerp*, where ſome Merchants knowing the Steward, prayed him to do them the honour, that they might beſtow a Dinner or Supper upon us. There was ſtriving who ſhould have us, and they were all very joyful to hear of the good health of the Marqueſs of *Auret*, doing me more honour than I expected. To conclude, we came back to the Marqueſs making good cheer, and within five or ſix days I asked my leave of him, which he granted with great grief, and gave me an honeſt Preſent, and of great value, and made me be conducted by the ſaid Maſter of his Houſe and two Pages, even to my houſe at *Paris*.

I have forgot to tell you that the *Spaniards* have ſince ruined and demoliſhed his Caſtle of *Auret*, ſackt, pillaged, rifled and burnt all the Houſes and Villages belonging unto him, becauſe he would not be of their ſide, in the ſlaughters and ruines of the Low-Countries.

The Voyage of Bourges, 1562.

THe King with his Camp remained not long at *Bourges*, but thoſe within yielded it up, and went out with their Jewels ſaved. I know nothing worthy of memory, but that a Boy of the Kings Privy Kitchin, who being near the Walls of the City before the Compoſition was made, cried with a loud voice, *Hugonot*, *Hugonot*, Shoot here, Shoot here, having his arms lifted up, and his hand ſtretched out, a Souldier ſhot his hand quite through with a bullet: having received his ſtroke, he came and found me out to dreſs him. My Lord High-Conſtable ſeeing the Boy to have his hand all bloudy, and all rent and torn, demanded of him who had hurt him. Then there was a Gentleman who ſaw the ſhot made, ſaid it was well beſtowed, becauſe he cried *Hugonot*, ſhoot here, ſhoot here. Then the ſaid Lord Conſtable ſaid, this *Hugonot* was a good Musketeer, and bare a pitiful mind; for it was very likely if he would have ſhot at his head, he might have done it more eaſily than in the hand. I dreſſed the ſaid Cook who was very ſick, but at length was cured, but with lameneſs of his hand, and ever after his Companions called him *Hugonot*.

The Battle of St. Dennis, 1567.

ANd as for the battle of Saint *Denis* there were divers ſlain as well on one ſide, as on the other: ours being hurt, went back to *Paris* to be dreſſed together with the Priſoners who were taken, whereof I dreſſed a great part. The King commanded me, by the requeſt of the Lady High-Conſtable, to go to her houſe to dreſs my Lord, who had received a Piſtol-ſhot in the middle of the ſpondyls of his back, whereby he preſently loſt all ſenſe and motion of thighs and legs, with retention of excrements, not being able to caſt out his Urin, nor any thing by the fundament, becauſe that the Spinal marrow, (from whence proceed the ſinews to give ſenſe and motion to the inferiour parts) was bruiſed, broken, and torn by the vehemence of the bullet. He likewiſe loſt his Reaſon and Underſtanding, and in a few days he died. The Surgeons of *Paris* were a long time troubled to dreſs the ſaid wounded people. I believe (my little Maſter) that you ſaw ſome of them. I beſeech the great God of Victories, that we may never be imploied in ſuch evil encounters and diſaſters.

The

The Voyage of Bayonne, 1564.

NOw I say moreover, what I did in the Voyage with the King to *Bayonne*, where we have been two years and more, to compass all this Kingdom, where in divers Cities and Villages I have been called into consultations for divers diseases with the deceased Mounsieur *Chaplain*, chief Physician to the King, and Mounsieur *Chastellon* chief to the Queen-Mother, a man of great honour and knowledge in Physick and Surgery: making this Voyage, I was always inquisitive of the Surgeons if they had marked any rare thing of remark in their practice, to the end to learn some new thing. Being at *Bayonne*, there happened two things of remark for the young Chirurgeons: The first was, that I dresst a *Spanish* Gentleman, who had a grievous great Impostume in his Throat: he came to have been touched by the deceased King *Charles* for the Evil. I made incision in his Apostеme, where there was found great quantity of creeping Worms as big as the point of a Spindle, having a black head; and there was great quantity of rotten flesh. Moreover there was under his Tongue an Impostume called *Ranula*, which hindered him to utter forth his words, and to eat and swallow his meat: he prayed me with his held up hands to open it for him, if it could be done without peril of his person; which I immediately did, and found under my Lancet a solid body, 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 apostеme was contained a slimy humour of a yellow colour, which was more than four spoonfuls; I left him in the hands of a Surgeon of the City to finish his cure.

Mounsieur *de Fontain* Knight of the Kings Order, had a great continual pestilent Fever accompanied with divers Carbuncles in divers parts of his body, who was two days without ceasing to bleed at the nose, nor could it be stanched; and by that means the Fever ceased with a very great sweat, and soon after the Carbuncles ripened and were by me dressed, and by the grace of God, cured.

I have published this Apology to the end that each man may know with what foot I have always marched, and I think there is not any man so ticklish, which taketh not in good part what I have said, seeing my Discourse is true, and that the effect sheweth the thing to the eye, Reason being my Warrant against all Calumnies.

The End of the Apology and Voyages.

FINIS.

ON the morrow, when I did in the Voyage with the King to Epsom, where we have been two years and more, to compass all this Kingdom, where in divers Cities and Villages I have had sundry consultations for divers diseases with the discreet Moorish Chyrurgian, chief Physician to the King, and Monsieur Cavelle chief to the Queen's Navy, a man of great honour and knowledge in Physick and Surgery: making this Voyage I was always inquisitive of the Surgeons if they had practised any rare thing of remark in their practice, to the end to learn some new thing. Being at Epsom, there happened two things of remark, for the young Clergyman of The Inns, that I told a story of, was had in glorious great Impatience in his Throat: he came to have been touched by the dreaded King Charles for the Evil. I made inclination in his Chamber, where there was found great quantity of crudity. Moreover there was under his Tongue a thing like a Bag, and there was great quantity of rotten stuff. Moreover there was under his Tongue an Impediment called Ranula, which hindered him to utter forth his words, and to eat and swallow his meat: he prayed me with his hand up hands to open it for him, it could by [illegible] without pain of his person, which I immediately did, and found under my Lancet a Cyst bubble, which was five ounces, like curds which are drawn from the bladder. The patient was a big strong Almond and the other like both long Bones, which were five in number: in this apostume was contained a thing like unto a yellow colour, which was more than two spoonfuls. I left him in the hands of a Surgeon of the City to finish his cure.

Monsieur de Paroche Bruder of the Kings Oules, had a great continual pestilent Fever accompanied with divers Carbuncles in divers parts of his body, who was two days without coming to stool at the veely, nor could it be finished; and by that means the Fever ceased with a very great sweat, and soon after the Carbuncles ripened and were by me dressed, and by the grace of God cured.

I have published this Apology to the end that each man may know with what Fear I have always practised, and I think there is not any man for Skill, which exceeds not in good part what I have said, being as Diligent as may, and that the effect shew with the Glory to the Eyes, Creation being by Warrant equal to all Calumnies.

The End of the Apology and Papers.

ΑΓΓΕΙΟΛΟΓΙΑ:

OR,

A DESCRIPTION OF THE VESSELS 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

ANATOMICAL FIGURES,

The largest and faireſt that ever were publiſhed with any *Engliſh* Book.

IN THREE TRACTATES.

Tranſlated out of the ANATOMY of *ADRIANUS SPIGELIUS*, by whom theſe Parts are more largely and accurately deſcribed than by other Authors: the more full tractation whereof, being a part of *Anatomy* ſo uſeful in order to *Chirurgical Operations*, hath been judged very worthy to be annexed unto this preſent WORK.

LONDON,

Printed by *M. Clark* for *John Clark*, and are to be ſold at *Mercers Chappel* at the Lower End of *Cheapſide*. MDCLXXVIII.

A DESCRIPTION
OF THE
VESSELS
In the HUMAN
Of the THREE KINDS, viz.
Capillary, Arterial, and Venous:
WITH
ANATOMICAL FIGURES
OF THE
VALVULÆ SEMILUNARES

THE
PREFACE.

OF how great consequence a more perfect knowledge of ANATOMY is to the Art of PHYSICK and CHIRURGERY, hath been frequently and abundantly made out by Anatomists, Physicians, and Chirurgeons, upon occasion, in their several 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 success 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 Compass, as a Physician judge of the Natural Action, or Preternatural Affect of any part of the Body: or a Chirurgeon institute any Operation about the same, without the Anatomical knowledge thereof: and therefore no more shall be said to this effect.

Anatomy may be very commodiously reduced to four distinct Kinds, or distinguished according to so many Principal 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.

2. Ὀστεολογία, Osteologie, which is the description of all the Bones of the Body.

3. Μυολογία, Myologie, being the Anatomical History of all the Muscles.

4. Ἀγγειολογία, Angeiologie, describing all the Vessels of the Body, i. e. the Veins, Arteries, and Nerves: these last though having no sensible Cavities, being reputed Vessels in the account of Anatomists.

Now though all these parts or kinds of Anatomy are needful 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 further helps in our English Tongue, for improvement in the three latter 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 several 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 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 Anatomy, which is the last in the Enumeration, i.e. Angeiologie, or the Description of the Vessels; the more exact or particular knowledge whereof, especially of those in the habit of the body,

body, will appear, upon a true accompt, more neceſſary to the exerciſe of Chirurgical Operations, at greater certainty, and with more ſecurity, than the knowledge of the Muſcles. Upon theſe conſiderations, being conſulted by the Publiſher of this Work, what Piece 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 advantageous in this kind, than a fuller and more Anatomical Deſcription of the Veins, Arteries, *and* Nerves, *in the Body of Man, Tranſlated out of the* Anatomy *of* Spigelius; *adding alſo the moſt uſeful* Anatomical Figures *relating to the ſaid Deſcriptions, of the ſame largeneſs 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 largeneſs 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 foremention'd Author, and an able Artificer to Cut the Figures. And as the Work 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 Original, ſtand in need of ſuch helps, if they will not be wanting to themſelves for induſtry in the uſe hereof.*

J. G.

TRACT.

TRACT. I.

CONCERNING THE VEINS.

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 *Cava* or hollow one. For it is wont to be diſtributed onely through the loweſt belly, and not at all to propagate it ſelf out of it; nor does it branch through all parts of that, but ſuch onely 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, Trunks, 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 called the Gate-vein, and now deſerves the name of a Trunk.

The Roots.

This Trunk parting now from the Liver deſcends ſomewhat obliquely towards the left ſide, under the Gut called *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 called in Greek Κυστικὸς, in Latin you may render it *Veſicalis*, the Vein of the bladder of Gall. *Veſalius* ſays 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 than the former, but lower, ariſing from the ſame fore-part, and more to the right, is inſerted into *Pylorus* or the lower mouth of the 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 lower mouth of the ſtomach, becauſe there are others alſo which are called Stomach-branches.

The Trunk.

The Twigs that grow out before the diviſion of the Trunk.

Cyſticus.

Gaſtricus.

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 ſomething higher than the right, but leſſer; the right lower, but greater: the *left* ſpreads it ſelf through the Stomach, the Kall, one part of the *Colon* or Colick 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.

The two branches.

Splenica.

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 towards 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 it ſelf through the upper region of the Stomach, and compaſſes the left orifice or mouth round about like a crown, from whence it is called Στεφανικὸς 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. 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 Kall, and the Colick Gut annexed thereunto, is commonly called Ἐπιπλοϊς Δεξτρα, 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

Circles riſing from the upper part of the Splenick-branch.

Coronaria.

Circles riſing from the lower part of the Splenick-branch.

Epiploïs dextra.

Epiploïs postica. other twigs, which are spent upon the lower membrane of the Kall, which like a Mesentery ties the Colick Gut to the back, as also upon that part of the Colick Gut, which is so tied. 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 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 three-fold twig, very famous among the Writers of Physick, which they commonly call *Vas breve*, the short Vessel, but we the Venal, to distinguish it from the Arterial 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. Which is the cause why some Physicians, and commonly Anatomists too, have foolishly thought that the Melancholick humour is returned from the Spleen through this Vessel 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 toward the right hand, like the fore-going, and compasses the bottom of the Stomach to 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 Kall-vein.

The division of the Splenick branch.

A propagation of the upper branch.

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 Colick Gut, goes on further by the whole length of the strait Gut, and at length determines in the membranous substance thereof, and in the fundament with many little twigs. Physicians make mention 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 Nostrils, Gums, and Mouth, that cast forth bloud, and without pain. In this large sense the Philosopher took it, 3. *De Part. Animal.* where he makes Menstruous purgations also a species of the Emroids. But the Emroids properly so called by Physicians, are dilatations of this Vein in the fundament, caused as well by black and yellow choler, as also by a salt flegm, as by the melancholick humour. And these are of two kinds; *Cæcæ*, blind Piles which cast out no bloud, but swell out like the stone of a Grape into the fundament, or out of it: Others *Apertæ*, open, which cast out the bloud 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, entering the very flesh of it about the hollow and middle line. And these are the sprigs which grow out of the Spleen-branch.

Hæmorrhoidalis interna.

1.

2.

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 the Mesentery betwixt its two coats, are each of them cleft into an infinit number of small branches, and they again into less twigs, which going to the Guts make up those Veins so famous among Physicians, 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 two-fold; 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 Circle Gut, the *Cæcum* or blind Gut, and the right side of the Colick 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 express 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, onely 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 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 progress, partly lest they should sink down, and withall the flow and ebb of the bloud 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 propagation, 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 distributed into the middle part of the Mesentery, and also that part of the Colick 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 Colick Gut, at last running forward through the whole length of the strait Gut, determines 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 first use of the Gate Vein.

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 feculent bloud, such as are all those parts which serve for nutrition. For their bloud ought to be thicker, that it might be hotter, when heat is always more powerful

powerful 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 vessel nourish the Stomach. For I do not think that the short vessel was made by nature for the carrying back of melancholick humors to the Stomach, but chiefly for its nourishments sake; when that blood which is generated in the Spleen, is not a melancholy and excrementitious humor, but rather the best, although somewhat thicker than other blood, and that because the parts that are to be nourished by the Spleen branch, needed a thicker blood, 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 propagation called *Duodena*; but the empty Gut, the *Ileum* or circle Gut, the blind Gut, and the right side of the Colick or *Colon* by the right Mesenterick-branch. The left side of the Colick and all the strait-Gut by the hæmorrhoidal 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 blood. But the same veins which nourish the Mesentery branch, do also attract the *Chylus*, as we shall shew you hereafter, when we shall insist upon the History of it. The second use. The third use is to empty out the excrements from the body through the Guts. Thus we see that the cholerick humour is sometimes poured forth out of the Liver through the Mesenterick-branch in the bloody flux, and cholerick loosness, and the melancholick dregs through the Emroid-vein. The third use. 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 splenick branch, not that the seat of melancholy 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 blood is presently harmed. The fourth.

But because there has been mention made here of the Emroid veins, it seemed that it would not be unreasonable 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, ἀιμορροΐδας ἰᾶται χρονίας ἢν μὴ μία φυλαχθῇ κινδυνεύει 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 dispute 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, whatsoever *Mercurialis* say, though otherwise a most learned man, bids us to burn 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 expressly, that *Hippocrates* says, that unless one Emroid be preserved, such danger will ensue, and makes no mention at all of diet. And what is more, daily 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 expel the humour, 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 cured 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. Not 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, says he, this *Alcippus* having the Emroids was forbidden to be cured, for after the cure he fell mad, but an acute 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, says, "That the Emroids came by reason of fæculent and melancholick blood, which the Liver drives "down to the mouths of certain veins, and so this way being stopt, an abundance of gross humors "burdens the Liver, and stifles the natural heat, which being extinguisht, no more blood is ge- "nerated, but only water, which nature afterwards driving it into the *Abdomen*, or paunch, "makes a Dropsie. But if the Liver send that abundance of melancholick humour to the Lungs, "some vessel 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 The explanation of a certain Aphorism of *Hippocrates*.

caused without an abundance of fæculent and thick blood; when it may be proved both by reasons and authority, that they come also from choler and phlegm. By 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 Strait-Gut, heats the blood, which is in the veins. For these veins being heated attract the blood out of the little veins that are near, and when they are filled, the inward part of the Seat swells, and the heads of the veins appear out of it. But by reason it is proved thus; when madnesses are caused by phlegm, or choler, as *Hippocrates* witnesseth 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 humors 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 be purged out by the Emroids. Wherefore if it happen, that one, who has been long troubled 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 natural heat, generates much water, and serous humour in stead of bloud, which passing through the veins, make a *species* of the Dropsie called *Leucophlegmatia*; but if the humor go back to the Breast, or Lungs, it breaks through, or eats out their vessels, and hence follows a spitting first of blood, 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 Iliacal 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 internal Emroids are caused, which being cured, the matters flow back into the branches of the Gate-vein, that are scattered through the lower Belly into which the veins being loden 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 Physicians, have fallen into a spitting of blood, 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 she fell at length after three or four months into a spitting of much blood. Although she was scarce ten years old, I let her bloud presently in the foot on that side on which she 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 blood 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* says 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 madness, and from that into an acute Feaver: sometimes also the bloudy flux follows, and others 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 superiour, or ascendent Trunk of the Vena Cava, *or Hollow vein, and the branches which it scatters through the Head.*

The use of the Hollow-vein.

WE 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 than 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 blood, and not so thick and fæculent, as that wherewith the Stomack, Spleen, and Gall are nourisht; therefore the bloud which the Hollow-vein makes, and carries, is also more pure, thin and sincere.

The method to be observed in the History of this 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 Custom of Anatomists, and so for perspicuities sake, we shall always 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 runs directly through the whole

whole Trunk of the body, and make one very notable ſtock [D] that is drawn out through the middle, and loweſt belly, like one ſtrait line continued, or rather in manner of a channel, or conduit pipe, is notwithſtanding wont to be divided into two by reaſon of the Liver, and ſoone to be called the Aſcendent Trunk, the other the Deſcendent. For indeed that is not true, to which many perſwade themſelves, 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 believe, 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 two 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 Crural 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 grows 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 grow out of the Hollow ſide of the Liver, which always 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 the 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 the midriff 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 leſſer than the Deſcendent, becauſe the upper parts are nouriſhed by it alone; but almoſt all the inferiour parts, that are contained in the loweſt Belly, by the Gate-vein. But although it be not parted into any branches, until it come to the *Jugulum*; yet before that it ſpreads ſome propagations at its ſides, and of thoſe, three notable ones. The firſt [e e] is that which is called *Phrenica*, or the vein of the Midriff, on either ſide one, and is diſtributed throughout the whole Midriff, which is called φρένες, 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 eighth Rack-bone of the Cheſt, is very ſtrongly infixt into the right ventricle [C] of the heart; that *Ariſtotle* did not without cauſe gheſs, 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 it ſelf 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 than the right ſide, becauſe of the continual, and greater motion there. But becauſe the fleſh of the Heart is hard, and ſolid, it ought therefore to be nouriſht with a thicker blood, from whence it is, that this branch grows out of the vein, before it enters the Heart, to wit, when the blood is ſomewhat thicker, and not yet attenuated in the cavities of the Heart. Near to the original of this there is a little valve, or floodgate, which hinders the blood from flowing back to the Hollow-vein, as it might eaſily do by reaſon of the continual 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. 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 on 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 paſs through the diviſion of the midriff, 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 it ſelf about the tranſverſe Proceſſes of the Rack-bones, and under the left production of the midriff and the original 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 about the tranſverſe proceſſes of the right ſide, and the right production of the *Septum* or Midriff, 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

Propagations of the Aſcendent Trunk.

Phrenica.

Coronaria.

ἄζυγος.

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 on both sides, as well right, as left, of which the right are more notable, and larger, of which there are numbred almost always ten; which run out to as many distances of the lower ribs, and make the inferiour intercostal veins. But I say they are almost always 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 furcles 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 betwen 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 , 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.

The division of the Hollow vein into the two Subclavian branches.

And here the Hollow-vein is first divided into two notable branches [EE] 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 *Claviculæ*, or Collar-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 reccital of them we will observe this order, that they which are neareſt to the Trunk, shall be first mentioned by us; and they last, which are farthest from it.

Propagations from the lower part of the Subclavian branches.

Intercostalis superior.

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 intercostal-vein; [e] there is on 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 [ff] overthwart, like the *vena sine pari*, to the two distances of the upper ribs. But if the *vena sine pari* send 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.

Another vein [g] sometimes arises from the forepart of the Bifurcation; sometimes from the root of the Subclavian-branch, and is double, on 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, whensoever it arises, going toward the fore-part; strives to get up to the higher part of the Breast-bone, and descends by the side of it, and when it comes 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 Navil, near to which it is joined by 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 eighth 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 apiece 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 vein *sine pari*, (with the extremities of which these are joined) were ended. From these veins, which are distributed in this manner to the distances of the Gristles, some others very worthy of our notice do arise, which are dissheminated both in the Muscles that lie 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 it self 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 Midriff. The fourth [i] commonly called *Cervicalis*, or the Neck-vein, is a large vein on 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 lie next upon the Rack-bones. When this vein has got above the Transverse Proces of the seven Rack-bones, it derives a Notable branch to 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 Proces of the sixth spondyl, or Rack-bone, and again another, when it has left the fifth Spondyl until at last it comes to the Proces of the first Rack-bone, which notwithstanding it does not touch, much less does it pass 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 part of the Neck. For there are two long *sinus* filled with blood, which are made out of the hard membrane of the Brain, one on each side, being

Mammaria.

Mediastina.

Cervicalis.

be ing 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 being 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, another 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 fifth vein [l] which arises from the hinder part, called *Musculà 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 rightlier called *Cervicalis*, or the Neck-vein) and also to those in the higher part of the Chest near to the Rack-bones.

For the upper part of the Subclavian branches, whilst 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 inward, 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 is less in a man, but in brutes it is contrary. But when almost all Appellations are derived, and that best, not from the place, through which the veins pass, but from their insertion, perhaps they might be rightlier named *Cephalicæ* or *Capitales*, Head-veins. The inner Jugular-vein [m] takes its original near to the joint, by which the Clavicles or Patel-bones are tied to the Chest, and as soon as it arises, it is joined with the *arteria Carotis*, or sleepy Artery, and a Nerve of the sixth 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 Jaw, distributes one branch to the Chops, and the other near to the Ears and Face. The inner branch, all the way is joined 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 unequal bigness. 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 sixth 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 fore-part of the Head, and after that by the way it has bestowed a Surcle 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. We 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 external 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 the more inward parts, the other *Cutaneus* 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 *Larynx* or Throttle, and the Glandules that grow to it, as also to the Muscles of the Chops, and of the bones called *hyoides*, among 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 other 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, and enters the Skull, through the first hole of the Temple-bone. The next [t] passes out of the fore part of the eye through the second hole of the Wedg-bone, at which the second pair of Nerves get out, and runs with some Surcles through the thicker Membrane upwards. The third is scattered out of the bredth of the Nostrils through the hole of the *Os cribrosum*, or five-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 joined with the remainder of the branch of the other side, and makes the strait vein, which they call *vena frontis*, the Fore-head vein, [y] and which in madness is opened to very great advantage. To this the *Satyrist* alludes, when speaking of a certain foolish fellow, he says, — *Medium perfundite venam.*

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 *Musculà 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 external Jugular-vein, and is dispersed into the Muscles, and skin of the back-side of the Neck, in regard whereof we shall not do amiss to call it *Cervicalis superior*, or the higher Neck-vein [6]. But now let us return to the distribution of the Subclavians

Propagations that arise from the upper part of the Subclavian branches.

Jugularis interna.

External.

Jugularis Externa.

Profundus.

Three branches entering the skull.

Cutanea.

Musculà sup. rior.

vian vein, from which we have digreſt. This vein, as ſoon as it gets out of the cavity of the Cheſt

The Diviſion of the Axillary vein into two branches.

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 diſſeminated throughout the whole Arm. But before the Axillary-vein be thus divided, it ſends forth two twigs: the firſt [γ]

Its propagations before its diviſion.

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 than the following, it is a very notable one, and runs through the inſide of the pectoral 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 ſide of the Cheſt is diſtributed eſpe-through the third broad Muſcle or *Latiſſimus* that moves the Arm backward ſcattering many little branches from it ſelf, which afterwards are joined 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.

Scapularis interna.

Externa.

Thoracica ſuperior.

Thoracica inferior.

CHAP. III.

Shews how the Axillary-vein is diſtributed through the Arm.

The diviſion of the Axillary vein.

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 *Cephalica*, 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, and 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 it ſelf 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 blood ſpins out with a force; but of the contrary, the Cephalica being cut, it comes forth ſoftly: which we ſee ſome Phyſicians unskilful in diſſections, ſtanding by whilſt the vein is opened, fooliſhly refer to the ſtrength, or weakneſs of the mind or body. We are now to ſpeak briefly of the manner of the diſtributionof both theſe veins through the Arm, beginning from the upper, as the leſſer branch.

The Cephalick-vein.

The *Cephalica* [G] therefore is called by *Uſalius 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 doth 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 Antients, who thought ignorantly that it ariſes from the external Jugular vein, and therefore empties the blood immediately immediately out of the Head. But it ariſes from the upper part of the Axillary vein, and climbing over the Tendon of the *Serratus minor*, or leſſer Saw-Muſcle, that bends the ſhoulder blade forward to the Breſt, it runs betwixt the Muſcle called *Deltoides*, which lifts up the Arm, and the beginning of the Pectoral Muſcle, which brings it forward to the Breaſt, where it ariſes from the Clavicle or Collar-bone, and ſo it runs down by the Arm to the outſide of the firſt Muſcle that bends to 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 always 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, whilſt it is thus carried down by the upper 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 preſents it ſelf to the ſigt without diſſection. But about the very joint of the Cubit at the exernal protuberation of the Arm, it is wont to be divided [H] for the moſt part into three branches, an outer,

Three branches of the Cephalick-vein.

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 into the ſubſtance of the Muſcles, eſpecially of thoſe two that bend the ſecond, and third joint of the finger, 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 Phyſicians call *Mediana*, the middle vein [λ]. This running down obliquely by the middle Region of the Cubit, diſtributes many Surcles to the *Radius* or wand, and at length it ſelf is divided into two leſſer branches; of which the outer [ρ] goes to the inſide of the writ, 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 the diſeaſes of the Head or Teeth. Now the third branch [ν] or outer Cephalick-vein climbs up to the Muſcle called the long *ſupinator* Cubit, and in that ſame place is joined with a little branch [τ] of the Baſilick-vein; being united thereto it goes on to the outſide of the writ; and diſtributes veins to that part of the Hand, which of the *Radius*, or wand, diſperſing divers little veins into the skin, and ſo is carried obliquely [υ] through the *Radius*, or wand, and having attained to the middle of its length enters the outſide of the lies before the little, and Ring-fingers, as alſo to the fingers themſelves. This vein, eſpecially that

Talamella.

which

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 extreme parts, as being more removed from the fountain of heat, and therefore wanting a hotter and more spirited blood. This vein therefore being cut, because the inoculations are so near, it cannot be but that the blood 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 blood which is emptied out of the Hand, is much fairer and redder than that out of the Arm, because the Arterious blood there always 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 blood is drawn out of those vessels wherein it was.

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 of 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 bend and stretch out the Cubit, and not far from its egress 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 progress. 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 *Radiens*) goes down to the Hand, and scatters little branches toward the Thumb or 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 *Cubitens*) 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 bow of the Arm, and being united with the inner branch [x] 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 it self 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 the bodies does demonstrate, that scarce 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 opening of the 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 counsel, than the scrupulous opinion of unskilful men.

CHAP. IV.

Explains the lower, or descendent Trunk of the Hollow-vein.

The inferiour 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. Nevertheless (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 Back-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 Iliacal branches afterward reaching into the Legs make the Crural-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 crural branches.

Four propagations arising from the Trunk before its division.

Adipsa.

For the descendent Trunk then [TV] before it part into the 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

and sends forth a propagation from its own left side which they call *Adiposa sinistra*, the left fatty vein [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 [on the right side] answering to this on the left 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 *Adiposa dextra*, the right Fatty vein. Yet sometimes you may see the contrary also to happen, and this right vein to come forth of the Trunk, and the left out of the Emulgent. For there are divers sportings of nature to be seen 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 Loins, 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 *Emulgentes*. *Emulgens*, because the Kidneys seem by this pair to milk out the whey or serous moisture in the blood, and to draw it to themselves. It is therefore very thick, but yet short, and not of equal 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 unequal, because it was fitting the left should be longer than the right, by reason that it was necessary to bring the spermatical 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 than the right, because the left Kidney is also seated higher than 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 determine with their small hairy ends in certain fleshy processes, which they call *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 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 gravel or stone. For this matter is not only a crude and uncocted kind of blood, which like a mucous matter sometimes is wont to abound in the mass 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 Stome, are very often troubled with reums and pains of the Colick; of which whilst some perswade themselves that it is caused by wind, daily 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 Colick-gut always 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 practice 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 Physicians does for the most part follow, *Lib. 6. Patholog. c. 12*, thinks that small gravel is bred in the proper substance of the Kidneys, and washed from thence by the flowing of the Urine and carried into the cavity, and so the Urine full of gravel 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 than the right; we must conclude that this happens, because the Colick-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 nearness, the Kidneys are exceedingly cooled; experience having often taught us, that this kind of phlegmatick matter is indeed actually exceeding cold in the as they have sufficiently perceived, who have voided it in great plenty by stool. After this there follows a third part [χ and ♄] called *spermatica*, or *seminales*, the spermatical, or seed veins, because they carry down matter for making of the seed. These differ in their original. 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 contorted into certain varicous circlings which are joined with the spermatical Artery by *Anastomoses* or Inoculations, and at length it ends in the Testicle of its own side. But the right spermatical vein [χ] arises not out of the Emulgent, but the Trunk it self, 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*,

The place in which the stones of the Kidneys are bred.

Why the left Kidney is more subject to the stone, than the right.

Spermatica.

not

nor reach into the ſhare-bones, but before they come to the Teſticles, are cleft into two unequal branches; the leſſer of which is ſcattered into the ſides of the womb, toward the bottom of it; the greater being joined to the ſpermatical Artery, and inoculated with it, enters into the Teſticle on its own ſide. Laſt of all the fourth pair is called [X] *Lumbares* the Loin veins [444] two, or three which the Hollow-vein ſends forth from its back-ſide, which looks towards the bodies of the Rack-bones of the Loins; and therefore they are not to be ſeen, unleſs 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 ſpinal 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 internal 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 unequal bigneſs, of which one is called the inner, the other the outer. The inner is leſs, 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 ſpinal Marrow. The diviſion of the Trunk into the two Iliacal branches. *Muſcula ſuperior.* *Sacra.*

But from both the Iliacal branches many veins iſſue, before they go out of the *Peritonæum* or Rim of the Belly toward the Legs; and from the inner branch two. The firſt [7] ariſes from the out-ſide 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 out-ſide, or Back of the bone *Ilium*, Hanch-bone, as alſo to the very joint of the Hip, and 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 amiſs called *Clunæa* from its inſertion, becauſe it is implanted into the Muſcles called *Clunæi*, 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 ſwells with a more feculent 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 ſpermatical 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 *Coyledones*. Which we have ſhewn here at *Padua*, publickly in the Theater, the firſt year of our being Profeſſor, in the carkaſs 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 it ſelf did pour out a thicker blood, 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 blood 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 Iliacal branch. *Clunæa.* *Hypogaſtrica.* *Hæmorrhoidalis externa.* *Cyſticus.*

But we have obſerved, and ſeen divers times, whileſt we were about the cure of Ulcers in the privy members, and the 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 than 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 Wives virginity, becauſe they find the privy paſſage very wide, it will behove them to conſider, whether their flowers were not at that time upon them. Now at length the remainder of the inner Iliacal Trunk makes to the Share-bone, and taking to it a propagation of the outer Iliacal, together with which it makes one vein, and ſo paſſing through the *Peritonæum*, and hole of the Share-bone, it ſpreads it ſelf into the leg, and is extended almoſt beyond the middle of the Thigh on the inſide.

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 rich Muſcles of the *Abdomen*. For paſſing with its chief branch out of the *Peritonæum* or Rim of the Belly, it climbs ſtrait up on both ſides under the right Muſcle, till it come near to the Navel, where it is joined by *Anaſtomoſis* with the deſcending Mammary-veins. But this *Anaſtomoſis* or inoculation is ſeldom found in men, Propagations of the outer Iliacal branch. *Epigaſtrica.*

but

but in women it is very conspicuous, from whence also *Galen Lib. de Dissect. Ven. & Arter. Cap.* 8. witnesseth, that great sympathy betwixt the womb and the Brests 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 says, If you would stop the courses in a woman, apply a very great Cupping-glass to her Breasts. And in the thirty seventh; If the Brests of a great bellied woman, do of a suddain become small, the child proves Abortive. And in the thirty eighth; if one of the breasts of a great bellied 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 Brests 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 lustful, as *Asra* is in *Martial*. But it is convenient to note concerning the original of this Vein, that very often it arises out of the Crural branch, which we shall by and by describe,

Pudenda. but oftner out of the Iliacal. Another vein is the *Pudenda* [11] which arises from the inside of the outer Iliacal 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 God, 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 lie about the leskes, whence arises that conflux of matter into these

Musculainferior. Glandules, in a pestilent or venereous *Bubo*. Lastly, the *Musculainferior*, or lower Muscle-vein [12] is that which goes to the joint of the Hip, and is dissheminated 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.

CHAP. V.

Reckons up the propagations, and branches of the outer Iliacal branch disseminated through the Crus, *or great foot, that reaches from the lower part of the Buttocks to the end of the Toes.*

THe outer branch then of the Iliacal 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 Crural-vein [L]. The History whereof that we may

The division of the Crural vein into a Trunk and branches. 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 Physicians *vena tali*, but improperly, as we have said above in our first Book. But it arises

Four propagations of the Trunk before its division. 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 strait downwards under the skin, through the insides of the Thigh and Leg; and when it is now come to the inner Ankle, it spreads it self

Saphena. into the upper part of the Foot, and scatters a branch overthwart, from which afterward many

Four propagations of the vein *Saphena.* 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 than once intimated, that nature is found to sport in the veins, but especially in those of the joints. the first [17] of these propagations, not far from the original of the vein it self, is dealt 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 it self 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 dissheminated into the skin of the forepart of the Knee, by the *Patella* or Whirl-bone, but the other into the skin of the Back-side, where the bending of Ham is, about which it is rowled orbicularly. The fourth [20] is carried to the middle of the *Tibia* or Leg, with furcles forward, and backward, over against the *Saphena*, another vein [14] is brought forth from the outside of the Trunk, but shorter than 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

Ischia. later Anatomists call *Ischia*. These propagations being brought forth, the Trunk afterward is

Musculi. drencht into the Muscles that compass the bone of the Thigh, and sets out a third propagation [15] which they call *Musculi* the Muscle-vein; and there use to be two of them. For the outer, which is the less, 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 de-

Poplitea. scending 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 of 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 it self, 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

But presently after it's risen 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, 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 determines.

The division of the Trunk into two branches.

And this is the progress of the Crural-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 head of the Thigh, in which place [Δ] it is cleft asunder into two branches, an outer, and an inner one. But they are of unequal bigness, the outer being the smaller, and the inner the greater, but both of them [⊖Λ] are scattered through the Leg, and lowest part of the Foot. The inner [⊖] in its descent sends some propagations of 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 *Gastrocnemius 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 Ancle [22] and runs out as far as to the great Toe. The outer [Λ] is presently cleft into two lesser branches, that are likewise unequal, 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 *Gastrocnemius externus*, or first moving Muscle of the Foot, as also betwixt the *Gastrocnemius internus*, or inward Calf-Muscle, and the *Tibiæus 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 ties together the greater, and lesser bones of the Leg, it shoots forth a branch, which perforating the Ligaments runs into the Foot, and is scattered into the Muscles which bend the Toes of the Foot outward.

But the outer and less branch [Π] of the Crural-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 universal History of the Hollow and Gate-veins, where we have perfected the whole course of their distributions. It seems yet to remain, that we speak of the Umbilical, and Arterious veins. But because the Umbilical 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 than a vein, because it keeps the Liver in its place; as the stories of them do witness, who upon the cutting off, or wounding of the Navil, have suddenly died, their respiration being hindered by the weight of the Liver falling out of its place, and pulling down the *Diaphragma* or Midriff 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 counsel that we can give him, than to consult better with his own sense, or if he will contend further, to purge his head with Hellebore, that that dimness of the eye-sight may be a little taken away. But we shall with more convenience make mention of the *Vena Arteriosa*, or Arterial-vein, in the following Book, when we shall explain the history of the *Arteria venosa*, or venal Artery, because they are very like one another, and therefore the same pains may serve them both.

AN

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,*

aaa *as far as to the Hollow of the Neck; but it*

ππ *scatters some propagations, three in number.* The first *of these,* ππ, *is called* vena Phrenica *the vein of the Midriff, which is distributed on both sides into the Midriff and* Pericardium, *or Purse of the Heart growing thereto, as also into the* Mediastinum *or partition of the Chest.*

b b Another *is* Vena Coronaria *the Crown-vein,* bb, *which embraces the basis of the heart in manner of a Crown, dispersing many Sureles to the point of it.*

c c 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 Loins.*

ddd *There are ten propagations* ddd *from this, sent to as many bony distances of the ribs which are called* Intercostales inferiores, *the lower veins betwixt the ribs.*

B *Shews how the Trunk* AD *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, 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.*

EE Out of the lower part *issue five.* The first *is called* Intercostalis superior *the upper vein between the ribs,* e, *and scatters two Sureles* ff, *to the distances of the three upper ribs.*

e

ff 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 sureles to the gristly distances of the true ribs, as also to the* Mediastinum, *and Muscles that lie upon the Breast.*

g The third *called* Mediastina, h, *is disseminated into the* Mediastinum, *or partition of the Chest.*

h 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 springs to the Muscles, that lie upon the Rack-bones.*

i 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*

l

m *vein of the Hollow of the Neck,* m, *which having sent over small sprigs from it its outer branch to the Coupe, 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* oo *into the first* 1, *and second* 2 *sinus of the*

oo

p *thick membrane. But the formost and lesser,* p, *having entred through the seventh hole of the wedg-bone, is scattered through the sides of the thick membrane.*

q The second *is the outer Jugular-vein,* q, *which getting up by the sides of the Neck is divided near to the*

r *Ears,* r, *into two branches; of which the one called*

ſ Profundus, ſ, *is variously disseminated into the Muscles of the* Larinx *or throttle, and the bone called hyoides, as also into the Tongue, the Palat, and hollowness of the Nostrils, and lastly into the skull with three propagations, of which that which passes* t, *out*

t *of the forepart of the eye, through the second hole of the wedg-bone, is very well delineated here.* The other

u *called* Subcutaneus, u, *first of all spreads its fore-*

x *branch* x, *into the Muscles and skin of the Face, which joins with its fellow about the top of the nose,*

y *and makes the Forehead vein* y, *then it issues out another hinder branch, which partly creeps upward along*

z *the temples* z, *and partly is carried behind the ears to*

α *the skin of the back part of the head.* α The third,

β 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*

1 *is marked with* 1, *the second or left one with* 2, *the third*

2 *with* 3. *The hinder part of this, which is nearer to*

3 *the Nowl of the Head, is shadowed, but the fore part, which is next to 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

γ first *called* Scapularis interna, *or the inner vein of the*

δ *shoulder blade,* γ, *the other* Scapularis externa, *the outer blade vein* δ, *the Basilick vein also* I, *before it*

ε *enters the Arm, propagates two;* one *called* Thoracica superior, *the upper Chest-vein,* ε, *which it distributed through the inside of the Pectoral Muscle, and in women, through the Dugs:* the other *called*

ζ 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,*

η *sends away a sprig,* η, *into the Muscle* deltoides, *and*

θ *another* θ, *into the Muscle 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

H *into three branches.* H, The first, ι, *or deep and middle*

ι *one goes to the Muscles arising from the said protube-*

κ *ration.* The second, κ, *or inner goes to the making*

λ *of the vein called* Mediana λ. The third μ, *or outer*

μ *is carried obliquely,* ν, *by the* radius *or lesser bone of*

ν *the Cubit to the outside 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-*

τ *silick-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 Surele,*

o, 10

o, to the heads of the muſcles of the Cubit; and then another notable one π, which being carried down obliquely, beſtows its ſurcles upon the Muſcles that ariſe 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, when it comes to the bending of the Cubit, is L M N divided into two, M, one of which called Radieus N, at the Radieus or leſſer bone of the Cubit; the other O called Cubiteus, O, at the greater bone of the Cubit, goes to the hand.

P Subcutaneus, or the branch next under the skin P, Q near to the inner protuberation of the arm is divided, R Q, into two other, of which the inner R, together with the inner branch of the Cephalick ν, 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 begins about the Region of the Liver T, and ends about T the fifth Rack-bone of the loins V. There are four V twigs growing from this. The firſt υ, called Adipoſa υ or fatty vein diſtributed to the membrane of the Kidneys. The ſecond Φ the emulgent going to the Kidney. Φ The third, præparans vas, the preparing veſſel; the right one χ, ariſing out of the Trunk TV, χ the left ϕ out of the left Emulgent, both afterward go- ϕ ing into the Teſticles ω. The fourth is the three Lum- ω 444 bares or loin-veins, 444.

The diviſion of the Deſcendent Trunk V, into the XX two Iliacal 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 Iliacal-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 Iliacal 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 Abdomen, where they are joined by Anaſtomoſis, or inocu- 10 lation 10. The ſecond called Pudenda, 11, ſpent upon 11 the Privy Parts. The third Coxalis, 12, upon the 12 Muſcles of the Hip.

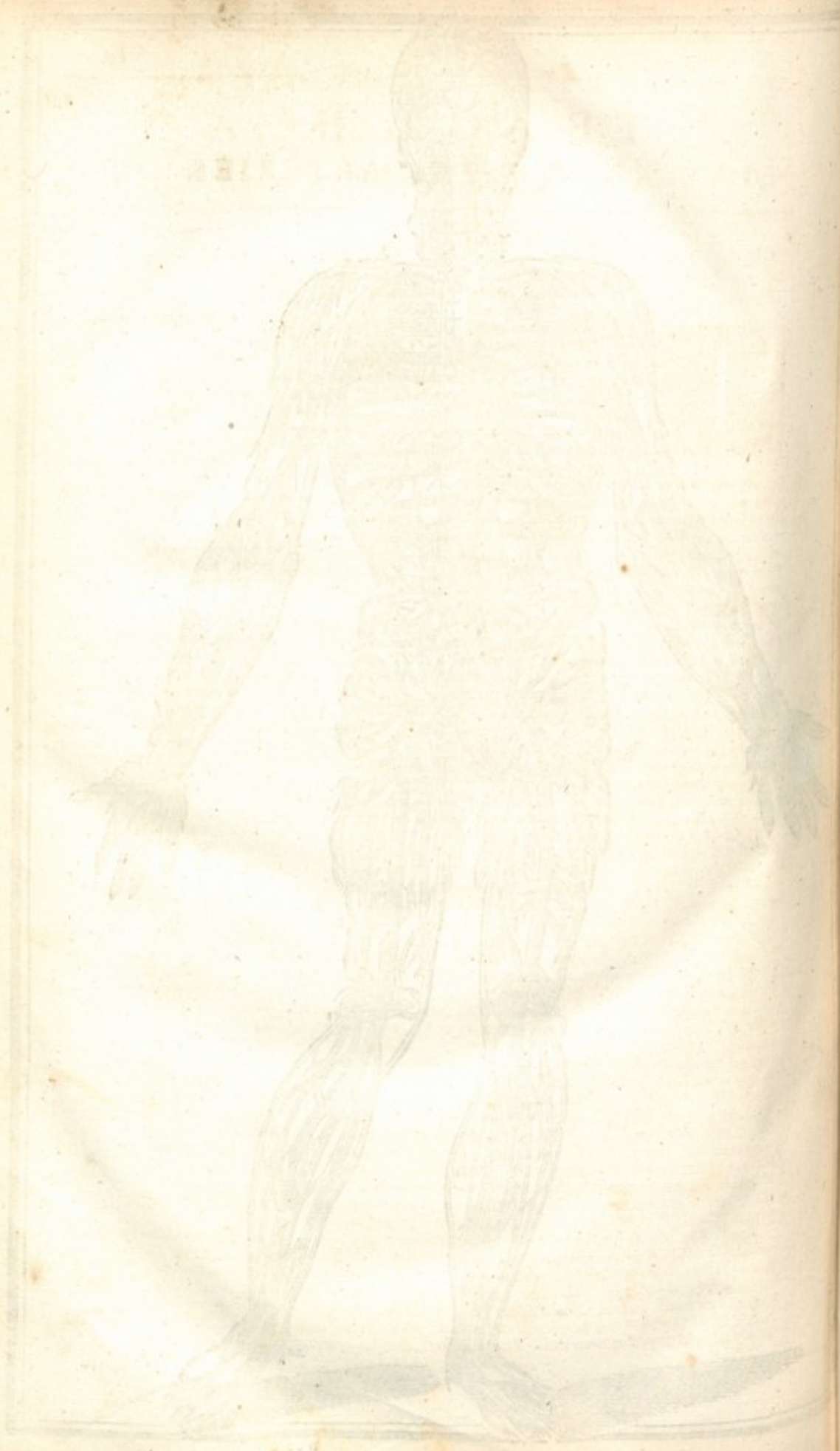
Here the outer Iliacal vein having paſt through the Peritoneum or rim of the Belly enters the Crus, and Γ begins to be called the Crural Trunk Γ, that is undivided as far as to the lower heads of the Thigh. But it reaches forth four propagations before its diviſion. The firſt 13, is called Saphena, which creeps 13 through the inſide of the Leg, under the skin as far as 14 to the ends of the Toes. Another 14, called Iſchia is ſpread out into the skin upon the Hip-bone. The third 15 15, named Muſcula is ſent to the Muſcles, which 16 extend the Leg. The fourth 16, named Poplitea is diſtributed into the Calf of the Leg.

13 The vein Saphena alſo ſcatters from it ſelf 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 med- 19 dle of the thigh: the third 19 into the knee: the 20 fourth 20 is carried forward and backward to the middle of the Leg.

Δ The diviſion of the Crural Trunk near to the two Θ lower heads of the thigh into an inner branch Θ and Λ an outer one Λ.

Θ The inner diſtributes little branches to the Muſcles 12 of the Calf 21, and then runs down under the inner 22 ankle to the great Toe 22.

Λ The outer preſently is cleft into two branches, an Ξ inner one Ξ, and an outer Π. That is ſpent wholly Π upon the 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.



TRACT. II.
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 original 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 grisly than 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 compass 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 than 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 perpetual and more violent motion, wherein more bloud is digested than 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 onely one, at whose orifice a little valve is found. Those propagations being thus disseminated, the Artery ascends somewhat under the Trunk of the *vena Arteriosa* or Arterial vein, and pierces through the *Pericardium*, and having got above it, is cleft [B] into two branches, which because of their natural greatness 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 than the upper, because that serves more parts than this: For the ascendent one goes onely 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 progress 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 Original of the great Artery.

Arteriæ Coronariæ, the Crown Arteries.

The divisions of the great Artery into two Trunks.

What parts both the Trunks nourish.

The order of that which is to be said.

The Ascendent therefore or upper Trunk of the *Aorta* [C], 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 says 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 vital Spirits and the bloud are driven back to the Heart, and from thence are sent up forcibly to the Head, which being stuffed, eruptions of bloud are caused by its dropping forth at the Nostrils, as also Catarrhs and Distillations, it being driven down undigested to the interiour parts. And hence also a reason may be rendered, why some upon drinking of cold water after vehement motions and exercise of body, have presently been suffocated, the passion of the heart, and grievous swoonings following thereupon. For the Artery being vehemently cooled, the bloud 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 fearful symptoms, and then sudden 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, than such things, as by reason of the thinness of their parts have a power of dissolving the clots of bloud. Hence also a reason may be given, why in burning Fevers the Tongue becomes black, and the diseased can hardly swallow. For although it be true (which is the cause commonly assigned) that many vapours are sent up from the whole body to the head; yet we may ascribe a main cause of this blackness to the nearness of the Artery, which being set on fire and inflamed, procures much mischief to the Gullet, and consequently to the Tongue it self.

But the ascendent Trunk, whilest 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 *subclavia* as long as they are in the Chest, for the same reason as the subclavian veins are so called, because they run under the *clavicula* or collar-bones: but as soon as ever they are fallen 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 Intercostal Artery, or *Intercostalis*

The division of the ascendent Trunk into two branches.

The subclavian Arteries.

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.

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.

ostalis superior [b], which being fastned to the roots of the ribs, bestows particular branches upon the distances of the four uppermost which run under the ribs, together with the veins, as far as to the grisles, 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 spinal 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 nowl-bone together with the vein, through whose first notable hole, by which the spinal marrow descends out of the head, it enters the skull. After this it is joined with its fellow of the other side under the spinal marrow, which remains yet in the skull, and so runs strait forwards, under the middle of the *basis* of the brain; but when it hath now attained to the *sella* 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 nerves, where being broken on both sides into an infinite number of furcles, they are dispersed betwixt the first and second pair of the nerves, and folden together with the thin membrane, make that complication of vessels called *plexus Choroides*. The next is *arteria mammaria*, or artery of the paps [d], which being reflected under the breast-bone (accompanied with the mammary vein) descends along its sides, and when it comes to the grisle 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 near the navel, 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 grisles of the seven true ribs, which branches determine together with the grisles. A third [e] is otherwise called *Musculà* the Muscle-artery, but might be 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.

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 pectoral 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. 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* near 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 *Valverda* witnesses in *Anatom. lib. 6. c. 11.* that *Realdus Columbus* made trial in a young man, among a great company of men. They are unequal in bigness, the right one being much thicker than the left, but they tend directly upward, being carried along the sides of the neck, and fastned to the rough artery, and to the internal 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 less, 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 back side of the ear, from which two branches under the ear enter the nether jaw through the first hole of it, that is seated at his 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 outer 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 unequal branches, to wit, a greater and a lesser one. The lesser and hindmost [s] is carried together with the greater Encephalick branch of the internal Jugular-vein, to the back-side of the skull, enters through the second hole of the *occipitium* or nowl-bone, and goes into the *sinus* or canale of the thick membrane. The greater and more forward [t] having entered the cavity of the skull through a hole made on purpose for it in the temple-bone, and attained to the saddle of the wedge-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 furcles makes the *Rete mirabile* or wonderful 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 furcles 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 wedge-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

ſubſtance of the brain, to the original 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 vertebral 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 chorroides*.

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 arm, where the muſcles which extend the cubit ſtick to it, it ſends forth two propagations [l and 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 [nn] 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 the *radius*, or leſſer bone of the cubit (whence I call it *Radius*) and goes directly to the wriſt, in which place Phyſicians 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 ſtrait along the *ulna* or greater bone of the cubit (and for that reaſon I call it *Cubitum*) and is diſperſed into the palm of the hand. But it is ſo hidden among the muſcles, that it is hardly perceived to beat, unleſs in lean folks; and therefore Phyſicians always 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.

Brachialis truncus, the trunk of the arm.

The diviſion thereof into two branches: The outer branch.

The inner branch.

CHAP. III.

Shews the Inferiour or Deſcendent Trunk of the great Artery, and the propagation thereof through the middle and loweſt Belies.

WE have ſaid above, that the great Artery [A] as ſoon as it is 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 we explain the other alſo.

The deſcendent trunk thereof [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 midriff through that diviſion reſembling a ſemi-circle, which is betwixt the productions of the *ſeptum tranſverſum* or midriff, preſently it runs out by the rack-bones of the loins, leaning upon the middle of their body, till it come to the laſt of them, where near to the *Os ſacrum* it is divided [R] into two notable branches [SS] which with our Anatomiſts we will call *Iliacæ*, 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 *Phrenicæ* or arteries of the midriff, the Cœliacal one, then the upper Meſenterick, the two emulgents, as many ſpermatical ones, at laſt the lower Meſenterick, and the *Lumbares*, or arteries of the loins. Of theſe the Intercoſtals are ſcattered, whileſt the trunk is yet in the cheſt; the reſt, whileſt it paſſes on through the loweſt Belly. But ſome of them accompany the branches of the gate-vein, as the Cœliacal, and both the Meſenterical arteries, others thoſe of the hollow vein, as the reſt. Now we will treat of theſe in order, begining from the Intercoſtals or arteries between the ribs, which are placed uppermoſt. Preſently therefore after the deſcendent trunk [Q] is iſſued forth, from its backſide 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 [uuu] in reſpect of the upper Intercoſtal, of which we have ſpoken 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 channels are cut out for them. But as the Intercoſtal veins reach in the true ribs onely to the griſles, 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 parts of the ribs, but in theſe run out a little farther:

The deſcendent trunk. Its progreſs.

Its propagations.

Intercoſtales inferiores, the arteries between the lower ribs.

farther. And these arteries send over some propagations through the holes of the nerves to the spinal marrow, and to the muscles that lie upon the rack-bones of the back, just as we have said the intercostal veins were propagated. But the use of them is to diffuse the vital spirit, and the bloud 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 conveyed forth by help of the kidneys, to wit, the vein *sine pari*, or without a companion, a little branch whereof in the left side goes into the emulgent of the left kidney. But this way which we shew through the Intercostal arteries, is by much the shorter; that I pass by this, that any matter heaped together may be more easily dispatched away through the arteries than the veins. Nor needs any one here to be affraid lest the vital spirits should be infected from these excrementitious and ill humours, whereby the heart may incur fearful symptoms; when we willingly grant (which experience also hath often taught us) that whilest the corrupt matter is emptied out by the urine, the sick parties have often fallen into fits of swouning, and other diseases; sometimes also have died suddenly when the peccant humour hath been of too great a quantity, or too bad a quality, and hath 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 says, 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, senseless, 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 deprivation in that part, and livid spots appear on the outside about the rib, whereabout the *Aortæ* (so he seems to call the lobes or division of the lungs) being inflamed fall to the sides. But if they be not much inflamed, so that they fall not down to the side; he says 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 other 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 back-bone. 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 furcles 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 compressed; from whence what else can follows but the resolution of those parts, into which those nerves are implanted, and to which they impart the faculty of motion? This opinion seems to me to be wonderfully confirmed by a certain pretty observation, which the learned *Cornelius Gemma* hath in his Book, *De Hemitræo Pestilenti*. A certain studious young man, says he, through the whole course of his disease, had his left eye less than the other. He was pained in the left side, especially all the time the fit raged; but about the *crisis* or judication thereof, the artery of his left leg being swollen 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 pulled back. Who will not here willingly confess, 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 given of another observation of *Galen*, which is *l.4. De locis Affect. c.4.* where he says thus: In a certain 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 laboured with difficulty of sense, and their motion also was somewhat impaired. 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 restored to his health, to wit, a medicin being applied 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 Physician, whose observations we have, being yet a boy, suffered Convulsion-fits in a grievous Pleurisie.

Their use.

The explanation of a place in *Hippocrates*.

2. *Phrenicæ*, the arteries of the midriff.

The arteries called *Phrenicæ* of the midriff, [xx] are two; one of each side, which arising 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 midriff, 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 grows to the midriff.

3. *Cœliaca.*

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 splenick branch of the Gate-vein, affords many branches to the Stomach, Liver, Bladder of Gall, Kall, the Gut *Duodenum*, the beginning of the *Jejunum* or empty Gut, a part of the *Colon* or Colick Gut, the Sweet-bread and Spleen. But it arises out of the fore-side of the body of the trunk, and being staid up all the way by the upper part of the lower membrane of the Kall, is divided into two notable branches, but of unequal bignes; one of which goes to the right the other to the left: that is the less, this is 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 smallness 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 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 two branches thereof. The right branch.

hath the propagations of the hollow vein, receives great plenty of vital ſpirits ſent over from the heart through the hollow vein. Yet before it enters into the liver, it diſſeminates in the way many ſurcles, and thoſe partly from its upper ſide, partly from its lower: from the upper ſide two, firſt, that which I call *Pyloricæ*, which ariſes in the midway, and being divided into many little branches is ſcattered into the backſide of the right orifice of the ſtomach. The outer is called *Cyſticæ gemellæ*, 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 colick gut annexed thereunto. The outer is cleft into two branches, of which one is called *Inteſtinalis*, the gut-artery, paſſes on to the *duodenum*, and the beginning of the *jejunum*, or empty gut: the other named *Gaſtro-epiploïs dextra*, the right ſtomach and kall-artery, ſomewhat larger than the former, turns down to the right ſide of the bottom 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.

Propagations from its upper part. 1. 2. From its lower part. 1. 2.

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 faſtned, and in the 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 leans upon the back, and aſcending from thence it compaſſes the left orifice of the ſtomach round about like a Crown, and diſperſes 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 Colick gut that is tied 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 entering 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 than veins. Whence it comes to paſs, that in inflammations of the Spleen, if you lay your hand to the left *Hypochondrium*, or place under the Griſle of the baſtard ribs, it ſeems to pant. But before this entery of the artery, 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 Kall, 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, make the *vas breve arterioſum*, or ſhort arterial veſſel, carries, 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 the choler to the Guts, and eſpecially to the *Colon*, into which ſome of its branches are implanted. Which is the reaſon, that in bloudy fluxes the Ulcers are almoſt always found in the great Guts, and eſpecially in the *Colon*, very ſeldom 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 it ſelf ſtore of choler, carries it directly over to the *Colon*, or Colick 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 humours, if at any time the Spleen abound with them to the Guts. Moreover by this ſame way the waterilh humours in ſuch as have the Dropſie, are ſometimes committed either to the Guts, or to the Kidnies and Bladder. This ſame branch is that by which the drink paſſes ſo ſuddenly through the whole body, and by which ill humours 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 preſcribed to them who are to take Purges, that the way may be open for the Medicins, as well that by which the excrements are ſent over the Stomach, as that by which they are conveyed to the Guts. This ſame branch alſo, if you add the two Meſentericks, is the ſeat of the hypochondriacal 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 ſymptoms that happen in this diſeaſe, may ſufficiently inform us.

The Left branch. Propagations from its upper part. From its lower part. Its diviſion. The uſe of the right branch. Why ulcers are more frequent in the great guts. The uſe of the cleft.

Meſenterica ſuperior, the upper artery of the Meſentery [y] ariſes a little below the Cœliacal, being diſtributed like the Meſeraick Vein (which is its companion) with numerous propagations in the guts called *Ileum* 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 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 paſs, that theſe glandules labouring with a hard tumor or *ſcirrhus*, the veſſels are compreſt, and a pining away of the whole body follows thereupon.

4. *Meſenterica ſuperior.* An obſervation.

The Emulgent arteries [z] are two, one the right, and another the left one. Both iſſue out under the fore-mentioned 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,

5. *Emulgentes.*

ther, as also it is in the Emulgent veins, the right one being lower than 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 Kidnies, 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. *Spermatica.* The Spermatical or Seed-Arteries [α] are likewise two, which arise out of the fore-part of the Trunk of the great Artery, their originals touching each other; for the left Artery issues not from the emulgent, as the left spermatical 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 onely water it at the sides, and pierce not at all into the inner parts of it. Which truly came to pass 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 Childbed, 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 Iliacal branches, and goes into the left side of the *Colon*, and into the strait Gut, descending with the hæmorrhoidal Veins to the very end of the Fundament, and making the hæmorrhoidal 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. Book of the Use of the Parts, seems to make mention of some other when he would have 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 says, 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 Anatomical 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 believed 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 Umbilical Arteries to the Child whilest it is yet shut up in the Womb. But if the bloud which is received up 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 than that of the Veins. But it is so laboured in the Arteries themselves, and in the Spleen, being haled into the Cœliacal Artery and carried to the Spleen. And this is an excellent use of the Mesenterick Arteries, whilest a man enjoys perfect health; besides which we will add 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 noisom humours out of the body, as choler, phlegm, and melancholy. Choler is thus expelled oftentimes in continual and intermitting cholerick Fevers, a solution whereof follows by a looseness: Phlegm is so expelled, 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 Physician. Lastly, Melancholy is conveyed out by both the Mesentericks, but especially by the hæmorrhoidal branch: whence *Hippocrates* says, 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 Felons or black pustles, called *Terminthi*, nor with the Leprosie, Canker, or other diseases. For there is a very great sympathy betwixt the breast and the hæmorrhoidal Artery, because the Trunk out of which it arises, descending from the heart, presently after it first issues from thence, propagates the intercostal branches. Moreover all black cholerick humors are purged by this means out of the whole body, that cankers and leprosie cannot be caused by them. From these voluntary purgings which nature it self has found out, we may now judg of such as are caused by the help of a Phytician, and may be termed artificial. For an opinion of some men hath prevailed much in our age, that the body cannot be purged by clyster, but only by those medicines which are taken at the mouth. But I will not only believe, but also being taught it by experience can witness, that, if the Clysters contain in them purging medicines, the whole body is very commodiously cleansed. For the whole Colick-gut receiving the matter of the Clyster, the vertue it self of the medicine draws down the noisome humors by the arteries out of the *Aorta* or great artery. Which being granted, we may give a reason (which we have seen very often) why Suppositories made of white hellebore produce the same symptoms, as are wont to be caused in them who have taken in white hellebore at the mouth. In like manner from hence we may fetch the reason why the belly is strongly purged, the region about the navel being anointed with purging medicines. For the vertue of the medicine 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 says: One that was vexed with the pain of the Colick on the right side, had some ease whilst the Gout held him; but this disease being cured, he was pained more. The reason whereof 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 crural 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

An observation.

Why anointing of the navel with such things as purge loosens the belly.

How the Colick is changed into the Gout; and on the contrary.

ſhorteſt, and moſt convenient way. Nor is there any reaſon, that we ſhould be afraid of that pollution of the vital ſpirits, which they will object to us if the excrementitious humors paſs through the arteries; for this betrays their great ignorance as well in Anatomy as in ſolid Phyſick: and it would be very eaſie, if I would digreſs, 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 expel; and the blood being ſtirred by their continual beating, as alſo by its own nature, makes all that is therein more fit to flow. And who will not believe that excrements are carried through the arteries, who conſiders the flowing down from the ſpleen, in which there being five times more arteries, than there are veins, truly it is neceſſary that that ballaſt of the ſpleen be carried out through the Arteries.

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 in 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 rack-bones, they climb up on 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 throught he *Peritoneum*, and muſcle 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 Phyſicians, by what ways, and in what manner the colick ends in a palſie or in the falling ſickneſs. For we have the obſervation in *Paulus Egineta lib.* 3. *c.* 43. where he ſays: 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 died; 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 meſenterical 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 blood 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 diſeaſes at *Padua* were Epidemical. Yet the Palſie is not always 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 on 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 weakneſs of body contracted by their ſickneſs, endeavouring 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 veſſels are carried.

Lumbares.

How the Colick diſeaſe ends in a Palſie or Epilepſie

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 continual motion by the hardneſs of the holy-bone. But it is divided, no otherwiſe than the hollow-vein is into two notable branches [S.S.] which are called by Anatomiſts the Iliacal arteries, from their ſituation, and being carried downwards obliquely to the thigh reſemble the Υ of the Greeks turned upſide down. But they alſo juſt like the Iliacal 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 Iliacal branches be divided, iſſue forth *ſacræ* the holy arteries, [ϑ] which are notable ones, and carried downward, leaning upon the holy-bone, paſs 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 Iliacal arteries are ſubdivided into two branches, one of which is the inner and leſs, the other outer and greater. *The leſs and inner* [T] iſſues out two propagations, one from its outſide, the other from its inſide. *The outer* [ε] is commonly called *Muſculæ*, by us more directly *Glutææ* 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 lie upon the *Os Ilium*, or haunch-bone, called *Glutæi*, or the muſcles of the buttocks; becauſe they are the authors of them.

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 bottom and neck of the bladder, as alſo to the ſtrait gut, which alſo may be called the Hæmorrhoidal arteries; but in women; to whom this branch is ſomewhat larger, it diſtributes a great number of propagations, beſides thoſe to the forenamed parts, into the lower region alſo of the bottom 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 fall 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 womb, cannot be laid in there, the arteries being preſt together with the falling down of it; ſo that neceſſarily flowing back, it fills the neighbouring veins and arteries, which ſwelling up cauſe theſe pains, for we 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 witneſſeth, that a woman vomiting blood is rid of her diſeaſe upon the iſſuing

The diviſion of the Iliacal arteries into an inner and outer branch.

1. *Glutæa.*

2. *Hypogaſtrica.*

iſſuing forth of her Terms. 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 Womb from the hollow one; there is no other ſympathy to be ſought for, than 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 Cœliacal, 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 bloud at the noſtrils to be profitable when the monethly Courſes do fail. The remaining part of the leſſer Iliacal Artery deſcends, and brings forth the Umbilical or Navel Artery [ϖ], which is carried down near to the length of the great Artery, and is tied with ſtrong membranes to the ſides of the bladder of urine. But it looſes its hollowneſs in thoſe that are once out of the womb. After this [θ] like the Iliacal 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 Iliacal 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 [σ], and is united with the ends of the branches [τ], of the inner Muſcle-artery of the Leg, of which we ſhall ſpeak in the next Chapter.

Arteria umbilicalis.

Propagations of the outer or greater Iliacal branch.

1. *Epigaſtrica*, or the Artery of the upper part of the lower belly.

Pudenda, or the Artery of the Privy Parts.

The *greater* or outer Iliacal artery [V] produces likewiſe two propagations, the firſt of which [ι] 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, till 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 joining 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.

CHAP. IV.

The Propagations of the outer Iliacal branch, which are diſtributed through the Crus, *or great foot, containing the thigh, leg, and foot.*

The Trunk of the Crural Artery and its propagations ere it be divided.

After that the outer branch [V] hath 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 crural vein takes, under which it goes, and is joined in company therewith every where, and ſo it makes the Trunk of the Crural Artery [X] (as we will always call it). But preſently after it hath got beyond the *Peritonæum*, it iſſues forth a propagation from the out-ſide, 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 fore-ſide of the bone of the thigh. Sometimes over againſt this, but oftner a little below, yet on the in-ſide another is brought forth, called

1. 2. *Muſcula cruralis interna*, the inner Muſcle-artery of the *Crus* [ψ] 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 Iliacal Artery, which we told you deſcends through the hole of the ſhare-bones to the *Crus*. Theſe propagations being diſpatched away, the Crural 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 hindmoſt heads of the thigh. For prudent Nature does always obſerve this, to carry down the Veſſels 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 back ſide 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

3. 4. ſprigs into the Calf of the leg. But whileſt it ſtays in the ham it ſends out a propagation [ϕϕ] 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.

After that the Crural Trunk lies in the Ham [Y], it ſends forth a propagation from its out-ſide [ο] 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 lie on the fore-part 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 back-ſide of the Trunk, which runs down as far as to the mixing together of the tendons of the Calf-muſcles. Then another [υ] iſſues out of the ſame back-ſide 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 [Γ] of the Trunk is carried downward by the back-ſide 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 [ϟ] beſtows 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 progreſs 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 onely 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*

a a — *shoots forth the two Coronary Arteries* a a, *which incompass the* basis *of the heart in manner of a Crown.*

But presently having past the Pericardium, *it is divided* B *into two trunks; one*

B C — *of which is the ascendent* C, *the other the descendent one* Q.

The Ascendent trunk C, *is by and by*

D D — *divided into the two Subclavian Arteries* D D, *both which when they have attained to the first rib, scatter many propagations, partly from the higher partly from the lower side.*

From the lower side issues Intercostalis superior, *the upper Artery between the ribs*

b — 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 rack-bones*

c — c, *creeping on by the transverse processes of the rack-bones of the neck, as far as to the skull. The second* mammaria, *the Artery of the*

d — *dugs* d, *which descending under the breast bone, runs out as far as to the seat of the navel, and distributes sprigs into the distances of the gristles of the true ribs, and then into the muscles that lie upon the breast; at length about the navel it joins by* anastomosis *or inoculatoon* x, *with the ascending* Epigastrick *Artery* τ. *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 nowl of the head.*

These branches being issued out, the subclavian Artery goes to the arm-pit, and takes

E — *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*

f — *parts of it: from 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

g — superior, *the upper chest Artery* g, *dispersed into the muscles on the foreside of the chest.*

h — *The third* h, Thoracica inferior, *the lower Artery of the chest, which descending along the sides of the chest, is inserted into the muscle called* Anascalptor, *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*

F F — *outer-blade Artery, being disposed of into the muscles, on the outside of the shoulder-blade.*

In this place the axillary Artery changes

G — *its name, and is called* Brachialis, *the trunk of the Arm that is undivided as far as* G,

l m — *scattering two twigs* l *and* m *into the muscles that cover the bone of the upper part of the*

n n — *arm on the back side; and two other* n n, *one of each side about the bending of the cubit.*

The parting in twain of the Brachial Artery under the bough of the cubit, into an

H I — *outer* H, *and inner branch* I.

The outer branch of this division, or Radius, *running straight along the* Radius *or*

o — *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 — p p p; *which are dispersed into the first outer fingers, the thumb and the two fingers next thereunto.*

I — *The inner branch or* Cubitus *passing along the greater bone of the cubit, is at length consumed in a double branch upon the two inner fingers, the ring-finger and the little one.*

L — *The remaining part of the Ascendent*

M M — *trunk, which near to the upper part of the breast-bone is cleft into two branches* 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*

N O — *two branches about* N, *one of which is the outer* O, *the other the inner* P.

† — *The outer* Carotis *propagates twigs* † *to the* Buccæ *or cheek puffs, and to the muscles*

q — *of the face; but about the ear it is cut into two branches, a foremost one* q, *which is carried through the Temples; and a hinder one*

r — τ, *that is disseminated along the back side of the ear under the skin.*

P — *The inner* Carotis, *going to the skull is divided near to the* basis *thereof into two*

ſ — *branches; of which the one and lesser* ſ, *which goes into the* sinus *on the side of the thick membrane, is cut off here, whereabout it sinks*

t — *into 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 rack-bones of the back.*

From this before its division at R, *many propagations are scattered, which we will now rehearse in order.*

u u u — *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*

x x — *more, called* Phrenicæ, *the arteries of the midriff* x x, *because they are disposed of into the midriff. Then follows,* Cœliaca *or the stomach-artery. After that,* Mesenterica superior, *the upper artery of the Mesentery* y, *reaching out into the Guts* Jejunum *and*

y — 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*

z — Emulgent Arteries z, *propagated to the*

kidnies. Then Spermaticæ, the Seed Arteries α, going to the testicles, under which is
α Meſenterica inferior, the lower Artery of
β the Meſentery β, departing into the left side of the Colick, and into the ſtrait gut, and making the hæmorrhoidal Arteries. Laſtly,
γγγ Lumbares, the Arteries of the loins γγγ, which going to the rack-bones of the loins joint by joint, are diſtributed into the peritoneum or rim of the belly, and the muſcles growing to the rack-bones.

R Theſe branches being iſſued forth, the trunk about the fifth rack-bone of the loins is
SS divided into two branches S S, called the Iliacal, 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
δ Artery δ, diſtributed into the holes of the Os ſacrum, or holy bone, to the marrow thereof.

T The inner Iliacal Artery before it falls out of the peritoneum, iſſues forth two propagations: from its outer ſide, that called Glutæa
ε ε, diſtributed into the muſcles of the buttocks; from its inner ſide, that called Hypogaſtrica
ζ ζ, going into the bladder and yard, and in women alſo to the bottom of the womb. After this it runs down, and ſends forth the
ηη umbilical arteries ηη, that tend upward near to the length of the great artery. The re-
θ mainder 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 ο, with the inner muſcle artery of the Crus ν.

V The outer Iliacal Artery likewiſe before it is going forth of the peritoneum, produces
ι two. The firſt is called Epigaſtrica ι, digeſted into the muſcles of the Epigaſtrium, and the ſtraight ones of the Abdomen, where it is
κ joined by inoculation κ, with the deſcending
λ mammary artery d. The other called Pudenda λ, goes to the privy parts.

X In this place the outer Iliacal artery having paſt the Peritoneum, enters the Crus, and begins to be called the Crural Trunk, which iſſues out more propagations. The
μ firſt is Muſcula 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
ν muſcle artery of the Crus ν, digeſted through the third bending muſcle of the thigh; and
ο thoſe muſcles that are on the inſide of the thigh; the ends of it are joined with the ends
π of the inner Iliacal artery about ο. The third is Poplitea, the ham-artery π, running out into the muſcles, on the back ſide of the thigh.

ρρ The fourth is Suralis, the calf artery ρ ρ, which is double, iſſuing out there, where the crural 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 lies in the ham, where it is divided into branches of unequal bigneſs.

σ A ſprig iſſuing from its out-ſide, and reacht out to the fibula or leſſer bone of the leg, betwixt the muſcle 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
Φ the leg, which offers a little branch Φ to the inner ankle.

χ The diviſion of the trunk χ, into an inner
⏚ branch ⏚, that is propagated to the great toe,
ω and the two next; and an outer ω, propagated to the little toe, and the two next to that.

The

TRACT III.

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 it self in the first place, which makes the *Optick Nerves*, that are so famous among all the Masters of Anatomy. For these are not onely the biggest, if thou 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 fore-part, 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 spinal marrow, that their original is as it were in the back part of the head, and presently each of them by little and little making towards its mate, they are united (not onely joined, as some would have it) over the saddle of the wedge-bone, and making one common square body, the marrow within them being mixed together. After that presently separating again, each of them is carried obliquely into the eye of its own side, entering the orb thereof through the first hole of the wedge-bone, and entering 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 Grapy 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 humours in them. These Nerves convey the faculty of seeing to the eyes; wherefore, they being obstructed, or compress, a blindness ensues. *Galen* hath ascribed holes to them, and *Herophilus* for the same reason called them Πόροις Ὀπτικοῖς, the passages of the sight, teaching that there is a sensible hollowness plainly to be seen in them, whom for all that almost all Anatomists do contradict. But I have heretofore shewed in the University of *Padua*, and in a great Assembly of them, 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 vanish away toward the eye. And therefore I shewed that the Ancients may not onely be excused, but also that they writ the truth; especially when none of them have said that these passages were great, but onely such as did not altogether escape the sight, if one would make trial 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 Problems, that besides the History it self, I may also shew the use of that which I say, especially when in our time they onely 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 sneezing often (especially when they have provoked it for the nonce) have of a sudden fallen 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, press together those Nerves; or else because a copious, and that a phlegmatick humour hath fallen 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 humours, have recovered, except one having the French Pox, who being anointed with Quicksilver, all the humours melting away, was restored to health. But it is not the part of a good and pious Physician to make use of those things, which being full of danger, may do more harm, if they prove hurtful, than they can procure good, if they be profitable. And truly it is better not to cure blindness, than to cause death, although often-times Rashness helps them, whom Reasons helps not, as the most elegant of Physicians *Celsus* says 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 humours to the notirils. 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 persuades, when the Optick Nerves in their original are not far distant from the palat, but farther from the spongy bone; and it is a preternatural way, by which the humours are carried, as hath been already demonstrated by 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 may 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 pass that it is slackned; but the muscles themselves swelling

The first pair of the brain.

Its original.

Progress.

Insertion.

Use.

The holes of the Optick Nerves.

Problems.

1.

2.

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
3. the most learned *Vega*, who cured a Woman in this case by procuring the flux of the terms, 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 looseness of the belly arising on a sudden, have received their sight, and that presently. The cause of their blindness was no other than the compression of these Nerves proceeding from the neighbour-vessels, to wit, the Veins and Arteries being swollen with bloud, which such a wound presently emptied. Wherefore I also sometimes, and not without success in that *species* of blindness 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 own accord.

The second pair. Its original.

The second pair arises, as the ancient Anatomists say, from the sides of the *basis* of the fore-part of the brain, near to the original of the first pair. But the new dissection shews, that it issues out at the inside of the beginning of the spinal marrow, and that they are so united in their original, 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 wedge-bone, which is somewhat long, and so it enters into the orb of the eye. By and by it is divided into many sprigs, which go to the muscle 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 that which lifts up the eye-lid, as that which lifts up the eye. Another very conspicuous 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, is sent into the muscle that draws down the eye. The fourth, into the lower or lesser of the oblique muscle that rowls the eye about toward the outer 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 onely to four muscles of the eye, and to that which lifts up the eye-lid.

Branches. 1. 2. 3.

use. The use of this pair is to impart the faculty of motion to the muscles of the eyes.

The third pair. Its original. Branches. 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 forward under the *basis* of the brain, being tied to the second conjugation; together with which it enters into the Orb of the eye through the said second hole of the wedge-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, which ought rather to be called the muscle of the eye-brows. This

An observation.

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 applied for the procuring of sleep. But hence also a reason may be rendered, why *Hippocrates*, *Prognostick* 1. 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 that the Nerves are very much dried, and so the brain it self, whence it comes to pass that they who are so diseased, for the most part suffering Convulsions afterward die. In some also a fore-runner of the Falling-sickness 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 humours begetting the Falling-sickness, and so a convulsion of the eyes and face is
2. 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 fore-part of the face, is spent upon the muscles that move the upper lip and wing of the nose outward, as also upon the lip it self, 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 nostrils, being spread throughout its coat, whereby it comes to pass that it is endued with a very sharp sense, and being but lightly toucht causes sneezing. The fourth goes out through that crevise which is betwixt the first bone of the upper jaw and the wedge-bone, in the outer angle of the eye, or through the fourth hole of the wedge-

use. bone, and departs to the inner side of the temporal muscle. The use of this pair is to convey the faculty of moving to the said muscles.

The fourth pair. Its original branches. 1.

The fourth pair arises out of the marrow of the brain on the back side, goes out of the skull through the sixth hole of the wedge-bone, and running strait down, propagates three branches from it self. The first is presently after its going out of the skull, which being writhed sometimes about in the manner of the tendrels of a Vein or Gourd, and united to two sprigs of the auditory Nerve (of which we are to speak next) afterwards distributes surcles to the temporal 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 back-side of the Nerve, and entering the hole of the lower jaw-bone that is bored in the inner surface of it, at the original of the processes, bestows little branches in order to the roots of the teeth, and at length going forth through the fore-most 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 gives it the power of distinguishing sapors or tasting.

A Note.

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

call that the ſmaller root, which we 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 original, nor in their progreſs. But that which they account for the fourth pair, ſeems not to be diſtinguiſhed from the third; as *Valuerda* himſelf grants, *lib.*7. *Anatom. cap.*4.

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 the 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 proceſs thereof, being a large one and winding. After this that harder part goes forthwith to the fore-ſide, being carried through a peculiar channel, 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, it is joined with that branch of the fourth pair (as we have delivered, but as others commonly count the pairs of the third) which we told you was writhed about, like the tendrel 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 noſtrils. But forthwith it is joined with the propagation of the fourth pair, that reſembles the tendrel 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 believe, that by the means of the branch it comes to paſs, 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 be called the Auditory Nerve, as miniſtring all the ſpirits that ſerve for hearing.

The fifth pair. Its original. Its two parts. The harder. The ſoft part. Its uſe.

The ſixth pair ariſes ſomewhat more toward the lower and hinder part than the fifth, 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 onely, but two diſtinct ones always, 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 egreſs inclines more to the fore-part 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 ſixth pair. Its original. The leſſer Nerve.

This on the contrary ſends its firſt propagation to the muſcles ſeated on the back ſide 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 ſide of the throttle, 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 tied to the divarications of the veſſels; which was firſt obſerved by the moſt learned Anatomiſt *Fallopius*, who would have it reſemble the body of one alive. But the greater Nerve it ſelf going into the middle betwixt thoſe ſame veſſels which I ſpake of, is carried leiſurely from the throttle to the rough Artery, and running down at the ſide thereof, tends to the cheſt.

The greater Nerve, and its propagations.

But before it enters thereinto, it is divided over the hollow of the neck into two branches, of which one is the outer and leſs, 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 into another manner than the left, we ſet down the Hiſtory of each by it ſelf; 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 *ſterno-hyoides*, and that of the *Larinx* or throttle, called *ſternothyroides*; 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 turned about the ſaid Axillary Artery, as it were an axel-tree, or (to ſay truly) 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 haſtes to the right ſide of the throttle, 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 throttle, and have their heads downward, giving motion to them. And this Nerve is called *Recurrens*, the returning one from its progreſs, and is very famous among all, being ſo made by skilful Nature with great wiſdom, that it might be inſerted into the muſcles of the throttle, 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 throttle is an organ of the voice, but the voice cannot be uttered without motion of the muſcles, that either open the cartilages of the throttle, 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 one continually makes a noiſe with barking, the other with grunting.

The propagations of the outer branch of the right Nerve. 1. 2. The right recurrent nerve.

For

For one of these Nerves being cut off, half 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
3. under the hollow of the neck, after that by the way it hath distributed surcles of an indifferent big-
4. ness into the *Pleura*, or membrane of the ribs, and into the coat of the lungs, and given others to the
5. *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 midriff, 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 encompass 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 onely 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 nearness 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 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 intercostal Nerves that issue out of the back bone; then passing through the midriff 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 natural 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 into 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
2. is spent upon the hollow part of the Liver and the bladder of Gall. The second goes into the
3. right kidney, and the membrane thereof. The third, which is greater than 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 tied thereto entering the center of the Mesentery in company of an Artery and a Vein. 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 hath offered sprigs both to the *Pleura*, or membrane investing the rib, and to the coat of the lungs, and that outwardly, as also to the purse of the heart, and heart it self 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 progress 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 it self obliquely to the right, and goes to the upper orifice of the Stomach, in 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 intercostal Nerves, and then passing through the midriff 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 tied thereto; another into the left side of the bottom of the stomach, and into the upper membrane of the Kall. The second propagation goes
1. into the left side of the Mesentery, and the guts of that place; sometimes also it issues sprigs, which
2. run out with the seminary vessels through the processes of the *Peritonæum*, or rim of the belly to the
3. testicles. The third goes to the left Kidney, and the fat membrane thereof. The remainder of the
use. branch passes 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 seventh pair arises in the utmost part of the nowl-bone, where the marrow of the brain is ready to go out of the skull, and so is counted the hardest of all the Nerves that have their original 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 planted betwixt that greatest one, which opens a way for the descent of the spinal marrow, and that, at which the sixth pair goes out) and presently after its egress is involved in one common membrane with the sixth pair, whence some not so diligently observing it, have believed that they were mixed 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 and motion from the brain to the muscles of the tongue.

To these seven pairs, which are commonly so numbred, we add an eighth, which makes the Nerves of Smelling, by which a faculty is derived from the brain of apprehending the odors 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

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 onely one half of them hath been shewn. They are very sharp at their original, and distant one from the other, but going forward by degrees, betwixt the uppermost and middle prominence of the brain, they grow thicker, and draw nearer one to another, and so at length they lie 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 than they who have expelled the teeth out of the number of the Bones, because they are not invested on the out-side 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 Spinal Marrow properly so called, and first of those of the Rack-bones of the Neck.

NAture, the wise Parent of all things, as she 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 it self 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, she made the Spinal 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 original 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 it self also *Plato* called Marrow; and it is named also the Spinal Marrow, or of the Back, to distinguish it from both those that are contained in the Back-bone, but either in the skull, as the brain, or in the hollowness of the bones, as that which is properly called Marrow. This substance is covered with two membranes, no otherwise than the brain it self is, from whence it takes its original, 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 and Membranes, to which those pairs of the brain do not reach. Therefore when there is a good number of Nerves arising therefrom, 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 original 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 the 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 it self) should be liable to breaking. Therefore that both these evils might be avoided, the wise Opificer made a double beginning, one on the fore-part, 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 Spinal Marrow.

Why it is called Marrow.

It is wrapt up into two Membranes.

The Conjugations or Pairs of the Spinal Marrow.

The first Pair thereof [*tab.*1.*a.*1.] arises with its first and foremost propagation [*tab.*1.B] from the fore-part of the Spinal 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 process of the second rack-bone is tied to the fore-side 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, towards 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 lifts up the Shoulder-blade

The first pair of the neck.

The second pair [*tab.*1.2.] with its fore-branch [*tab.*1.D] (which is slenderer than the hinder one, though both of them seem small enough) arising from the fore-part of the Marrow, goes forth betwixt the first and second rack-bones at the side of the Tooth-like process, 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 process of the second rack-bone, but presently is cleft into two branches of unequal bigness, of which that which is the thicker [*tab.*2.*fig.*1.F.] tends from the fore-part to the hinder, where the Muscles seated on both sides of the hinder part of the neck do meet together, and there being mixed [*tab.*2.*fig.*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 fore-parts, and so is distributed into all the skin of the head, as far as to the top of the Crown [*tab.*2. *fig.*1.H] as also to the ears. The other branch, which is the slenderer, is inserted into the great strait muscles, and the lower oblique ones, that extend the head. *Galen* makes mention of these branches

The second pair.

lib.

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, says 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 Rack 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 third 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 [*tab.*2.K] goes to the first bending muscle of the neck, or the long one: the second [*tab.*1.L] runs down, and being united with a sprig of the fourth pair [*tab.*1.Q] ends in the muscles that lie 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 *fig.*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 tends 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* πλατυσμα μυοειδες. The hinder branch [*tab.* 2.*fig.*1.O] is implanted into the second pair of muscles that extend the cheft.

Its fore-branch.

Its hinder branch.

The fourth pair.

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 unequal 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 than the other, and joined with a muscle of the fifth pair, and another branch of the sixth pair, near to the *mediastinum* or membrane that parts the cheft in the middle, and above the *Pericardium* passes on downward, that out of these three principles the Nerve of the midriff may be made up. The hinder branch [*tab.* 2. *fig.* 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 midriff 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 midriff hath two motions, one that is voluntary, which we use whilest we breath strongly; another natural one, when the fibres are extended and contracted of themselves. A man therefore is preserved by this natural motion, when we see that breathing is little, and weak, and as much as suffices that the lungs may be moved a little.

Its propagations.

1.

2.

3.

The hinder branch.

A question.

The fifth nerve.

The fifth pair [*tab.* 1. *numb.* 5.] goes out betwixt the fourth and fifth rack-bones, and like the two last foregoing, is cleft into two branches. The forwarder of them [*tab.*1.U] issues 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 fore part of the Rack-bones of the neck, and is implanted into the midriff, and so makes the midriff Nerve. The third [*tab.*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, and 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 clavicle 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 [*tab.*2.*fig.*1.c] is writhen toward the back-bone, and distributed in the same manner as the hinder branch of the fourth pair is.

Its fore-branch.

The hinder branch.

The sixth pair.

The sixth pair [*tab.*1.*num.*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 hath 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 midriff [*tab.*1.i] passing on farther is united with the two next following pairs, the seventh of the neck, and the first of the cheft, 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. The hinder [*tab.*2.*fig.*1.I] is carried to the hind muscles which extend the head and neck.

Its fore-branch.

Its hinder branch.

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 forwarder and greater branch thereof

The fore-branch.

[*tab.*

[*tab.*1. m.] is joined presently after its egress 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 leſſer branch [*tab.* 2. *fig.* 1. n.] goes to the muſcles, that lie 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 ſpinal marrow, whileſt it runs through the rack-bones of the back, as the moſt learned *Veſalius* hath 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, than thoſe of the neck. All theſe conjugations after their egreſs are divided into two; and the one branch which is the greater, always bends forward; the other which is the leſs is bent to the hinder parts, and to the muſcles that lie upon the back.

The firſt pair then [*tab.*1. *num.*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, 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 fore-parts near the length of the firſt rib of the cheſt to the breſt-bone, beſtowing a ſprig upon the ſubclavian muſcle, after that being reflected upward is ſpent upon the muſcles, which take their original 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 ſixth conjugation of the brain, and the third of the cheſt. The ſame branch alſo when it hath 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. The hinder and leſs branch [*tab.*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 hath 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 Monks Cowl, and in the third of the ſame, called *Rhomboides*, as alſo into the upper of the hindmoſt ſaw-muſcles.

The firſt pair. Its fore-branch. Its hinder branch.

The ſecond pair [*tab.* 1. *num.*9.] breaks out betwixt the firſt and ſecond rack-bones of the cheſt, and is cleft likewiſe into two branches. The forwarder [*tab.*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 things which hang at Cardinals hats; from which afterward all the nerves that go to the arms, iſſue forth and take their original. This ſpreads out a branch [*tab.*1.t] which goes forward through the firſt diſtance betwixt the ribs, according to the courſe of the firſt rim, as far as to the breſt bone, making the firſt Intercoſtal nerve, from which ſurcles [*tab.*1. u] are diſtributed into the muſcles that lie upon the cheſt. The hinder branch [*tab.*2.*fig.* 1. x] hath 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 egreſs are cleft into two branches of unequal bigneſs, one of which is the forwarder and greater, the other the inner and leſs. The forward branches [*tab.*1.y] (which make the nerves between the ribs) are carried into the foreſide, 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 rib. Theſe branches are joined with the intercoſtal Veins and Arteries, together with which they paſs along the rib of the fore-part through the *ſinus* or channel, 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 breſt-bone; but they which belong to the baſtard ones, are carried into the fore-part of the *Abdomen* above the *Peritoneum* or rim of the belly. From theſe nerves many branches are diſſeminated into the muſcles between the ribs, not onely in the inner, but the outer ones alſo, as well into the other [*tab.*1.z] which lie upon the cheſt; ſuch as are the fourth and fifth muſcles of the ſhoulder-blade, or the two foremoſt Saw-muſcles, as alſo to the broad one, called *Latiſſimus* [*tab.*1.&] that moves the arm backward from the breſt. In like manner a propagation goes from the fifth intercoſtal nerve, about the middle of the rib paſſing through the intercoſtal muſcle into the firſt pair of the muſcles of the *abdomen* [*tab.*1.] as alſo into the skin of the cheſt; and being divided in four parts is diſtributed into the pectoral muſcle that moves the arm forward to the breſt, and alſo into the skin, from which ſome ſprigs do afterward go to the nipples of the breſt [*tab.*1.y] and impart to them a very ſharp ſenſe. The hinder branches [*tab.*2 *fig.*1.] go 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 the 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 one to another, and ſo afterward they give nerves to all the muſcles which ariſe out of the tops of the ſpines of the rack-bones.

The other ten pairs. Their fore-branches. Their hinder branches.

bones. Such are the first extending muscle of the head, called *Triangularis* or *Splenicus*; 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 *Anisealptor*, and the hinder saw-muscle. A good number also of surcles are distributed into the skin of the back.

CHAP. IV.

Concerning the Nerves of the Marrow of the Rack-bones of the Loins.

FRom the spinal Marrow, whilest it is carried through the first of the Loins, although there be onely 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 Nerve of the chest; when from every one of them presently after its going out, one branch, and that the greater, spreads it self forward; the other and less, backward. The foremost branches run to the muscles of the *abdomen*, or outer and fore-part 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 loins. 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 have said the nerves of the arm were, whilest they make the net-like complication.

The first pair. The first pair then [*tab.*1. *num.*20.] as the rest do also, going out under the *Peritoneum* 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 egress is cleft into two branches. The fore-branch, which is greater, goes into the fleshy parts of the midriff, and into the beginning of the first bending muscle of the thigh, called Ψόας.

Its fore-branch.

From this Nerve a certain surcle [*tab.*1.39.] takes its beginning, reaching out for the most part with the preparing artery to the testicle. The hinder branch [*tab.*2. *fig.*1.*num.*42.] sends propagations into the muscles that lie upon the back side 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 muscles which extend the loins: but when they issue out from the tops of the spines, whereabout 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 [*tab.*1. *num.*21.] goes out under the first bending muscle of the thigh, called Ἰλιόας, 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 [*tab.*1.*num.*22.] issues forth likewise under the first bending muscle of the thigh, betwixt the second and third rack-bone. The fourth branch thereof passes over near to the hanch-bones, distributing two propagations; one which goes to the knee, and its skin; another [*tab.*1.51.] which accompanies the vein of the inner ankle, called *saphena*. The inner branch is reflected and disseminated into the muscles which lie upon the loins.

The fourth. The fourth pair [*tab.*1.*num.*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 Crural Ven and Artery.

The fifth. The fifth and last pair [*tab.*1.*num.*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 pair, 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 spinal marrow do issue forth. The first of these [*tab.*1. *num.*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 crural nerves, sends yet a surcle [*tab.*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 [*tab.*2.*fig.*1. *num.* 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 fore-part, 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 ex-

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 breſt; 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 ſpinal 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 ſpinal marrow, which is diligently and accurately to be committed to the memory, that we may know to what place remedies ought to be applied, if at any time from ſome external 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 applied always to the beginning of that Nerve, not to the place in which the ſymptom is perceived.

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 bellies, and the parts contained in them; it remains that we deſcribe thoſe alſo, which are propagated through the *artus*, or extreme 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 than to thoſe ſtrings of Cardinals Hats. This implication of Nerves goes forth under the clavicle or collar-bone, about the 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 original. But their riſe is very uncertain by reaſon of their being ſo knit together; wherefore we in our relation of them will rather follow the footſteps of other men than our obſervations, leſt we ſhould ſeem to affect new opinions rathly, and without neceſſity.

The firſt Nerve then [*tab.*1.c] 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 hinder 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.ξ] is thicker, and takes its original from that net-like complication, 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 pectoral muſcle that leads the arm forward to the breſt, and of the *Deltoides* that lifts it up. Being hid then under this muſcle it ſends forth two propagations [*tab.*1.] 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 progreſs a furcle [*tab.*1.β] from its out-ſide 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 come to the bending of the cubit, being led to the fleſhy membrane, near to the out-ſide 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 [*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 wriſt: 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 ſpecial 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 progreſs. Its propagations. Its branches. The outer. The inner.

The hinder 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, whileſt it paſſes through the arm-pit, before it hath yet attained to the arm, brings forth a propagation [*tab.*1.σ] which is diſperſed under the skin betwixt the pectoral muſcle that leads the arm to the breſt, and the muſcle *Deltoides* that lifts up the ſame. But when it hath firſt attained to the arm, it hides it ſelf under the muſcle *biceps*, or firſt bender of the cubit, and paſſing on downward together with the ſecond nerve, it ſends out a little branch [*tab.*1.τ] into the head of the ſecond bending muſcle of the cubit. After this deſcending it receives a branch [*tab.*1.υ] from the ſecond Nerve, by means whereof they are joined one with the other, and then it goes further through the fore-part of the arm unto the bending of The third.

the cubit, being always 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. Φ] 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 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. Χ] 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. ϟ] 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 entered 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 furcle [*tab.*2.*fig.*1. I] 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 furcle [*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 [*tab.*2.*fig.*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 [*tab.* 2.*fig.*1. Φ] into the second that extends the fingers; the third [*tab.*2.*fig.*1. Ψ] into the inner muscle that extends the wrist. But in its progress [*tab.*2.*fig.*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.

Its two branches.

The outer.

The Inner.

The fifth Nerve. The fifth Nerve [*tab.*1. *num.*32.] arising lower than any of the fore-mentioned, out of the 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 it self, but remains entire 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 fore-side 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, and sends out the first branch, which being parted into 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 furcle [*tab.*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 sixth. The sixth Nerve [*tab.*1.*n.*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 and of the cubit, under the skin it makes haste to the inner protuberation of the upper bone of the arm, dispersing many furcles in its way to the neighbouring skin [*tab.*1.37.37.] But as soon as it hath 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 [*tab.*1.38.]

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 forth through the common holes of the rack-bones as well as the Nerves, which are distributed through the arm, make a certain complication like the neithing of a net, but far greater than that other. Nor are these Nerves of equal bigness, but the first [*tab.*1. *num.*46.] and the third [*tab.*1.56.] are small, wherefore also they reach but to the thigh; the second [*tab.*1.50.] is somewhat thicker and reaches to the leg, but the fourth [*tab.*1.61.] alone is thicker than the three other put together, and is carried down as far as to the utmost ends of the toes.

The

The first Nerve then [*tab.*1.46.] grows out of the higher part of the Net-like complication, where the third Nerve of the loins is joined with the fourth [*tab.*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 [*tab.*1.48.] which runs out through the skin on the fore-part of the thigh, as far as to the joint of the knee, and there ends, and affords sarcles [*tab.*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 [*tab.*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 crural Vein and Artery, (which are the outer Iliacal branches) descends through the groin into the thigh, which when it hath attained to, presently it issues forth a notable propagation [*tab.*1.51.] from its inside, lying upon the *saphena* or vein of the inner ankle, on the fore-part, 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 [*tab.*1.53.] which it gives to the fore-side of the knee. But the trunk it self [*tab.*1.54.] when it hath sent out this propagation, passes together with the trunk of the crural Vein and Artery into the thigh, and is scattered into the muscles seated on the inside of the thigh, especially [*tab.*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 progress of the trunk.

The third [*tab.*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 [*tab.*1.57] to the two muscles that turn the thigh about, which they call *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 cloths the inner part of the thigh [*tab.*1.58] the remaining part [*tab.*1.57] lies deep, the chief propagation whereof [*tab.*1.60] is spent partly on the second, partly on the third muscle that bend the leg. The third.

The fourth Nerve [*tab.*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 onely in thickness, but in hardness 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 [*tab.*1.62] from its backside, which stays 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 [*tab.*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 [*tab.*1.64] to that fleshy lump of the fifth bending muscle of the leg, called *Biceps*, which grows to it on the inside, after it hath gone beyond the middle of the thigh. From hence also other sarcles 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 the knee betwixt the two heads of the bone of the thigh, and imparts a small branch [*tab.*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 [*tab.*1.66] in the inner cavity of the knee, or in the ham, into two unequal branches which are distributed along 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 onely 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 [*tab.*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 [*tab.*1.68] in the way which goes to the outer ankle under the skin, distributing in the mean time many sprigs to the skin. But the branch it self [*tab.*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 dispers little branches to the sides of the upper part of the toes. The inner branch [*tab.*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 into both the sides of the lower part of the toes. The fourth. The progress of the trunk. Its division.

An Explanation of the two Tables of the Nerves.

The thirty pairs of the Nerves of the marrow of the Brain, whileſt it is carried through the ſpine or ridge, are expreſt in theſe two Tables, the preſent and the following one. We have inſcribed common Characters on both of them, though many alſo be peculiar to one; after which we have preſently ſet the number of the Table.

THe firſt ſhews the rack-bones of the Spine and the Nerves that iſſue from thence on the foreſide; the ſecond on the back ſide.

1.1. &c. *as far as to* 7. *The ſeven rack-bones of the neck.*
8 *as far as* 19. *The twelve rack-bones of the cheſt.*
20 *as far as* 24. *The five rack-bones of the loins.*
25 *as far as* 30. *The ſix bones of the* Os ſacrum. *Theſe ſame figures do ſtand for the pairs of the ſpinal marrow.*

A tab. 1. &c. 2. *The ſeat of the ſpinal marrow, where it firſt enters into the rack-boner.*

1.1. B 1. C 2. 2. 1. D E 2. E 2. F *The firſt pair of the neck, whoſe forwarder propagations is* B, *the hinder* C.

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 back ſide of the head is marked with the letter* H.

3. 1. I 1. K 1. M 1. N *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 mixed with a twig of the fourth fourth pair* Q. *The third* M, *is mixed 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-boner.*

O 2. 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 O.

The hinder branch T.

The fifth pair of the neck, whoſe fore-branch V *iſſues out ſome ſircles. 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 *The ſecond* X, *making the greateſt part of the nerve of the midriff. 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 grows 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.*

a 1. b 1. c 1. d 1. e 2. 6. 1. f 1. g 1. h 1. i 1. l 2. 7 1. m 1. n 2. *The hinder branch* e.

The ſixth pair of the neck, whoſe fore-branch f, *when it hath propagated that ſircle* g, *which with the fourth and fifth pair* S *and* X, *makes the nerve of the midriff, is joined with the two following* h, *and thus it makes up the nerve of the midriff* i, *ſo that this ariſes out of three ſircles* S, X, *and* g.

The hinder branch l.

The ſeventh pair of the neck, whoſe fore-branch is m, *its hinder one* n.

8. 1. o 1. p 2. q 1. r 2. 9 1. t 1. u 1. x 2. 10, 11, 12. &c. to 19. inclusively 1. y 1. z 1. α 1. β 1. γ 1. δ 1. ε 1. ζ 1. ηη 1. † 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. χ 1. Ψ 2. ω Γ Δ Θ Λ Ξ Π Σ Φ Ψ Ω 3. 1. *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 ſircle t, *running out through the firſt ſpace betwixt the ribs, and ſending ſircles* u *to the muſcles of the cheſt.*

The hinder branch x.

The pairs of Nerves from the nineth 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 fore-part of the cheſt, and partly into their upper region,* as y; *partly in their lower* z; *which in women go alſo to the breſts; and then they ſend other ſircles into the heads of the oblique deſcending muſcles of the* abdomen α, *and into that which leads the arm from the breſt* β, *another goes to the nipple of the breſt* γ. *The hinder branches* δ.

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 *go to the two heads of the muſcle* biceps: *then it joins with the third nerve by a ſircle* †. *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, and an inner one* ν. *That deſcending along the* radius *or wand, is inſerted at the out-ſide of the ſecond joint of the thumb* λ. *This* ι, *is by and by ſubdivided into an outer* ω, *and an inner branch* υ. *This* υ *is again cleft in the region of the cubit into an outer branch* σ, *and an inner one* τ.

The third nerve entering the arm ϱ, *before it attains to the arm, ſcatters a ſprig betwixt the pectoral muſcle and* Deltoides σ. *By and by having entered the arm, it diſtributes another* τ, *into the ſecond muſcle that bends the cubit. After that deſcending it receives a branch* υ *from the ſecond nerve; when it is paſt the bought of the arm, it is diſtributed into many ſircles* Φ, *at length about the palm of the hand it is divided into three branches* χ.

The fourth Nerve entering the arm, which is the greateſt of all them that go to the arm, is not marked with any letters in the ſecond table, but in the third onely, leſt the ſecond ſhould be too much blurred with letters. This ſuddenly after it hath entered the arm, reaches out ſmall ſprigs ω *into the muſcles that extend the cubit, then another into the inner skin, upwards and downward* Γ, *and another into the lower part* Δ, *and another* Θ, *which goes as far as to the wriſt. After this near to the bought of the arm it is divided into two branches, an outer one* Λ, *and an inner* Π. *That* Λ *about the tranſverſe ligament is again divided into two* Ξ. *This* Π *reaching all along the cubit ſends forth more propagations, the 1.* Σ, *the 2.* Φ, *the 3.* Ψ. *Then another in*

31 its progreſs Ω. The remainder ends in the wriſt 31.

32 1. The fifth that enters the arm, which about the inner protuberation of the arm, is diſſeminated like to the third. Its firſt ſurcle 33, its ſecond 34, is third 35.

33 34 35

36 1. The ſixth Nerve of the Arm, which goes under the ſkin imparting many ſprigs to it 37, 37, 37, the end of it is 38.

37 38

20 21 The five pairs of the Nerves of the loins: the

22 23 firſt 20, the ſecond 21, the third 22, the fourth

24 1. 23, the fifth 24. A certain branch ariſing from

39 1. 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 of

41 1. the Abdomen; from which branches 41 goes into the muſcle that leads the arm outward from

42 1. the breſt.

The hinder branches of the Nerves of the loins. The ſix pairs of the nerves of the great bone. Of

25 26 theſe the firſt is 25, the ſecond 26, the third 27,

27 28 the fourth 28, the fifth 29, the ſixth 30.

29 30 1. A ſurcle reacht out from the fore-branch of

43 1. the firſt Nerve of the great bone to the inſide of

44 1. the hanch-bone, and ſo to the muſcles of the Ab-

45 1. domen that ariſe from that bone. Then another ſpreading out from the hinder branch to the muſcles ſeated on the back of Os Ilium, or the hanch bone.

The termination of the ſpinal marrow paſſing on without a mate, and undivided.

46 1. The firſt Nerve entering the crus. This ari-

47 ſes where the third Nerve of the loins meets with

48 1. the fourth 47. A branch of this 48 goes to the

49 1. ſkin, but 49 it is entangled among the muſcles that are ſeated on the outſide of the thigh.

50 1. The ſecond crural Nerve, a notable propaga-

51 1. tion whereof 51, runs out into the ſame courſe with the vein Saphena, to the end of the foot, and

52 1. there ends about 52. In the mean time it proffers

53 1. another notable ſurcle 53, to the fore-ſide of the

54 1. knee. But the remainder of the trunk 54 enters deep into the thigh, and gives out a ſmall branch

55 1. 55, but without queſtion the chief.

56 1.

57 1. The third crural nerve, whoſe propagation 57 goes to the muſcles called Obturatores, and another 58 to the ſkin. The remainder 59 lies deep

58 1. intangled in the muſcles whoſe chief propagation

59 1. is 60, which is implanted in the ſecond and third

60 1. muſcles that bend the leg.

The fourth, and that the thickeſt of all the

61 1. Nerves of the crus, whoſe firſt branch is 62,

62 1. which is inſerted into the ſkin of the buttocks:

63 1. another 63 is diſtributed into the heads of the muſcles that ariſe from the appendix of the hip:

64 1. a third 64 is given to the fifth muſcle that bends

65 2. the leg; and others 65 go into the outer calf-muſcle, and that of the ſole of the foot. But about the lower heads of the thigh it is divided

66 1. 66 into two branches, to wit, an outer one 67,

67 1. and an inner 72.

68 1. The outer branch, a propagation whereof 68 is ſent under the ſkin that covers the outer part

69 1. of the leg and the outſide of the foot. But the branch it ſelf 69 goes to the connexion of the leſſer bone of the leg with the greater; ſending

70 1. forth another ſurcle 70 to the fore-part of the

71 1. leg under the ſkin: the remainder of it 71 reaches along the fibula or leſſer bone of the leg.

72 1. The inner branch, a propagation whereof

73 1. 73 goes through the inſide of the leg toward the calf, and inſide of the foot under the ſkin:

74 1. and then another 74 is ſcattered into the ſkin, eſpecially that which covers the calf: another alſo

75 75 1. 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 propagation 76

76 1. runs out betwixt the inner and outer calf-muſcle.

77 1. The remainder of the trunk goes by the inner ankle to the lower part of the foot, diſtributing two ſurcles apiece 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 than the firſt Table does, ſo that all which concerns thoſe Nerves, may be ſhewn more accurately herein. But they have common characters, and the ſame explanation of the ſame ſerves for both.

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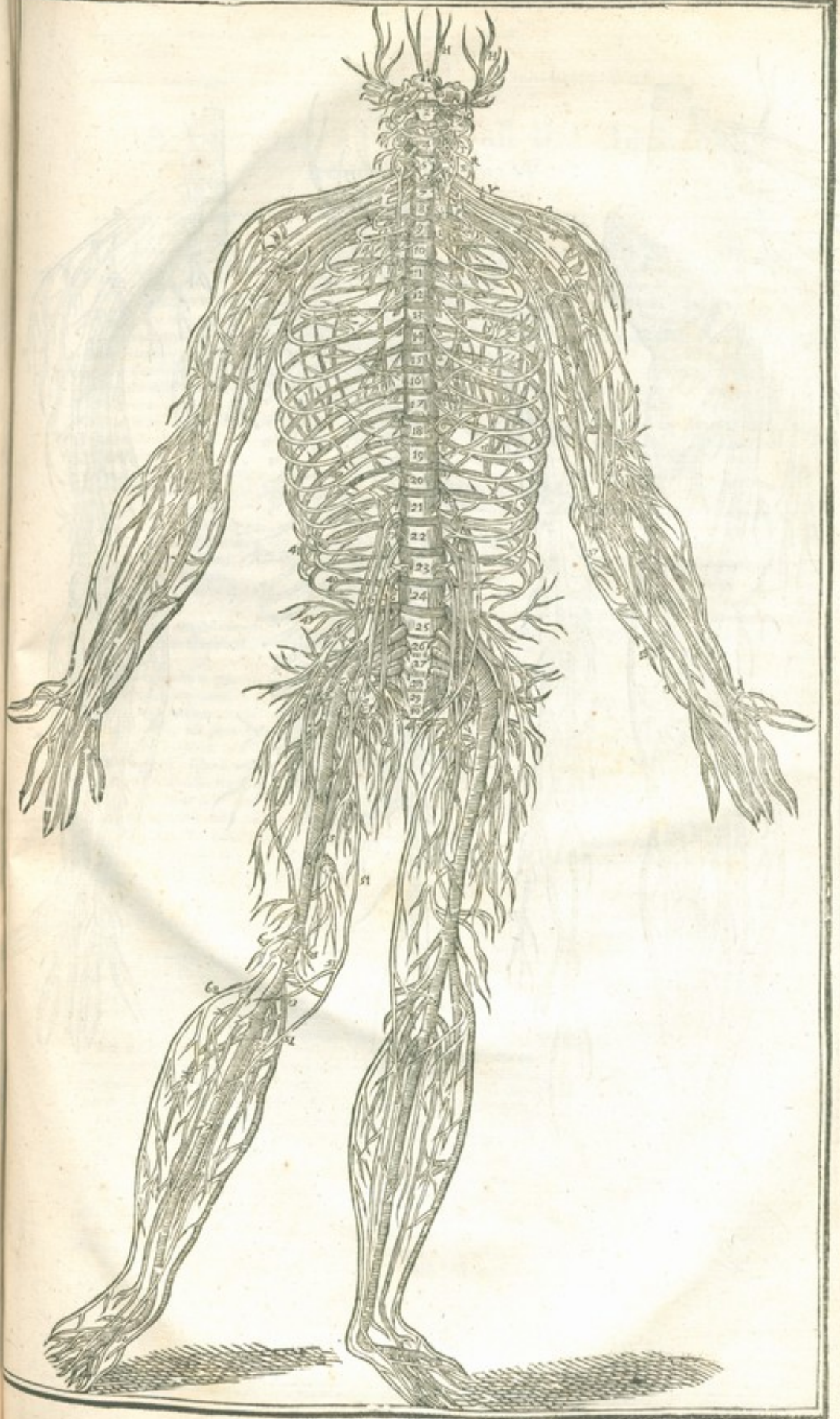

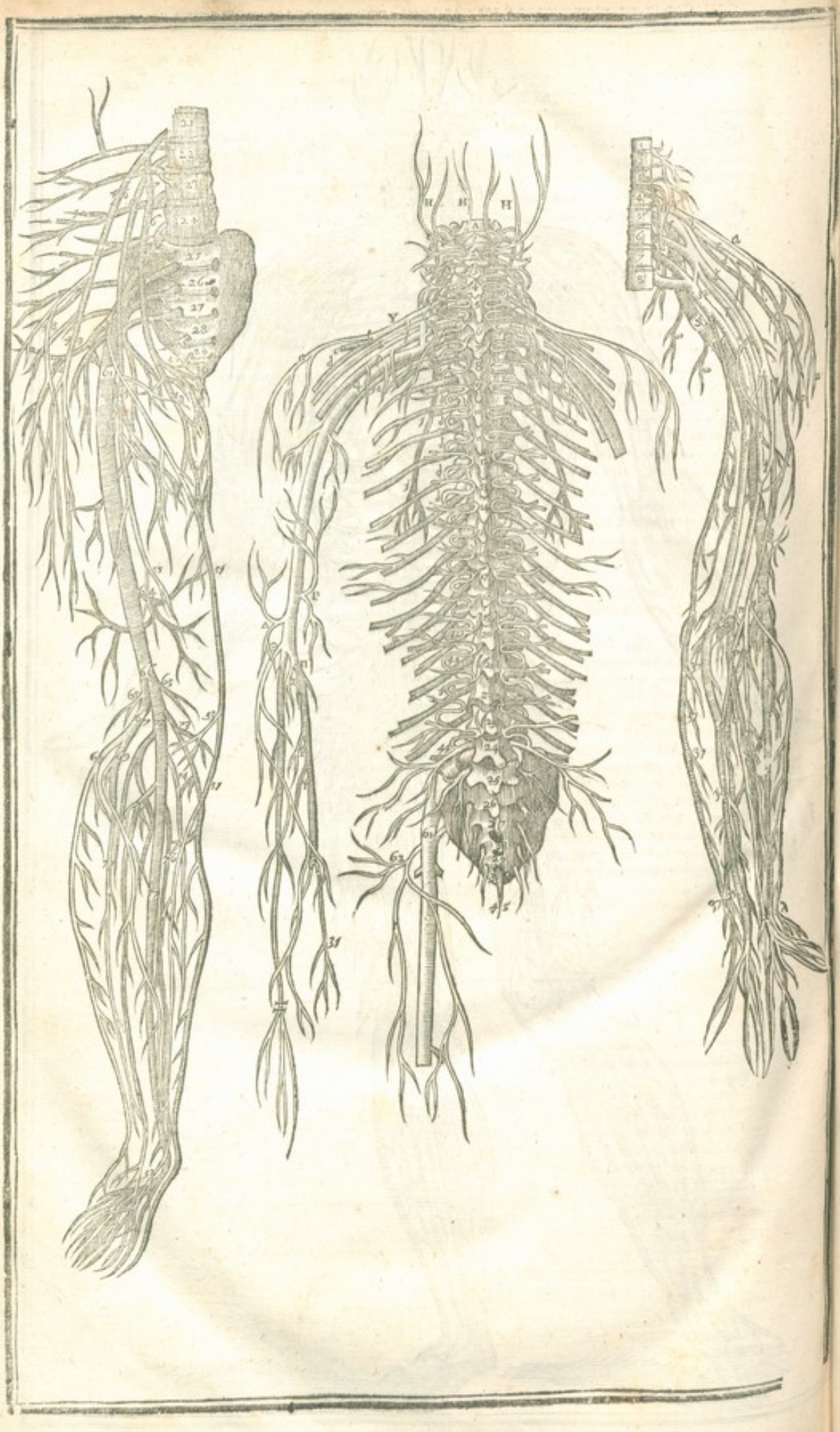

A General Table of all the chief things treated of in this Work.

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