Mikrokosmographia: or, a description of the body of man: being a practical anatomy shewing the manner of anatomizing from part to part; the like hath not been set forth in the English tongue, long since composed in Latine / ... Done into English by H. Jackson.

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A DESCRIPTION
OF THE
BODY OF MAN

BERENGARIUS

1664

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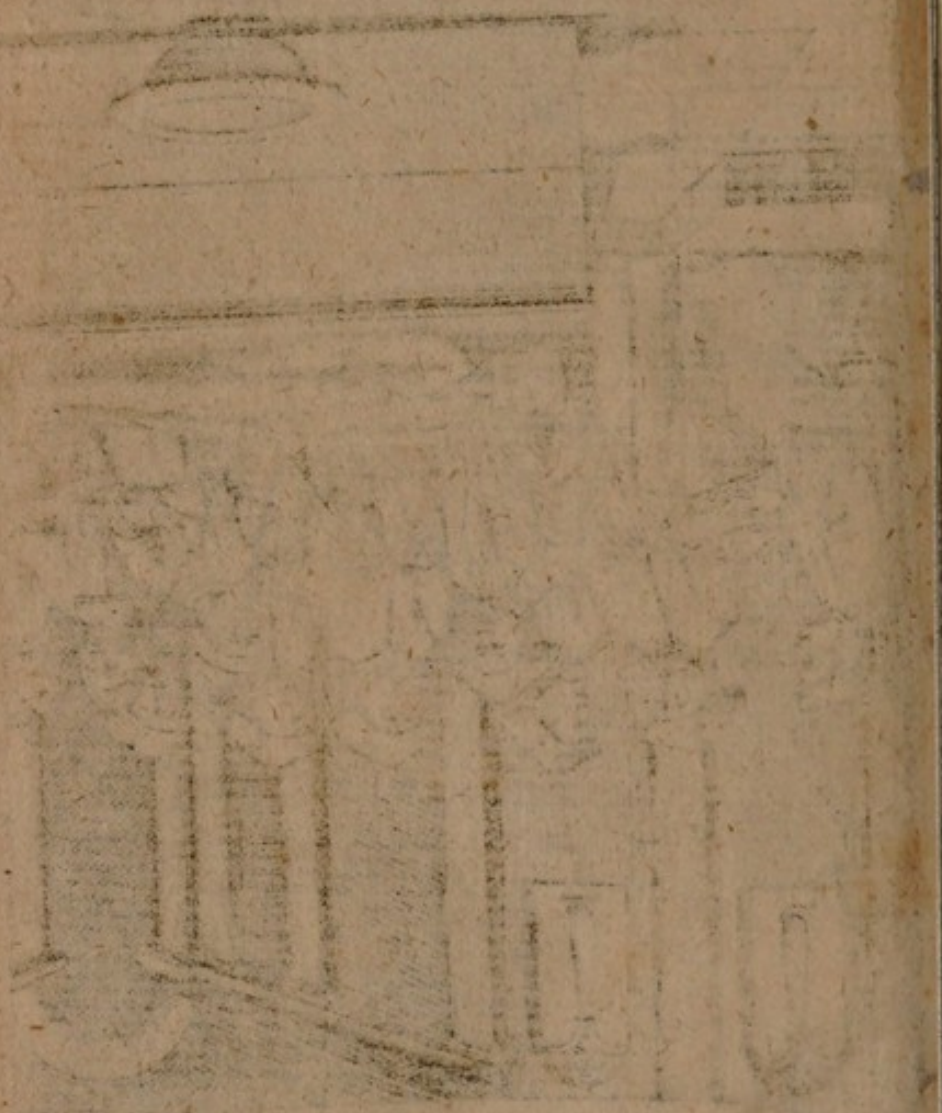

Μικροκοσμογραφια
or
A Description of the
LITTLE WORLD
or BODY of MAN

ΜΙΚΡΟΚΟΣΜΟΓΡΑΦΙ'Α:

OR, A

DESCRIPTION

OF THE

Body of Man:

BEING A

Practical Anatomy

SHEWING

The manner of Anatomizing from Part to part; the like hath not been set forth in the English Tongue.

Adorned with many demonstrative Figures

Long since Composed in Latine, by that Famous *J. Berengarius* of *Carpus*, Dr. of A. & P. Reader of Chirurgery in the University of *BONONIA*.

Done into English by *H. Jackeson* Chirurgeon.

By whom is also added a fit Etymon to the Names of the parts, in their proper place.

London, Printed for *Livewell Chapman*, at his shop in *Exchange Alley* in *Cornhill*, 1664.

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TO

The VVorshipfull Society of the Mystery and Commonalty of *Barber-Chirurgeons* of *London*, together with all Students and Practitioners in Anatomy, *Henry Jackson* a Member of the aforesaid Society commendeth these his Labours.

(*Most renowned Brethren, and Friends* :)

I Am provoked in my mind, after long deliberation, to publish this Work, being commanded in my first undertaking thereunto, by my aged Father, an ancient member of this Society, who having met with this Author in his Travels in *Italy*, esteemed it as a great Treasure, and too good indeed to be con-

cealed; which being in old and curt Latine, cost me not a little pains to put it into smooth English; and yet I never over-read the Work but I had comfort in it, and thought it worth all my pains. I have also been much encouraged by the commendations I have heard of the Book, by the learned Dr. *Guinn*, and Dr. *Andrewes*, in their publique Anatomy Lectures at our Hall, as also by that exact Anatomist Doctor *Wharton*, who hath had the perusing of it, and is pleased to prefix his Epistle to it. And now considering the great want there is of such a Work, that may be as a Directory to young Practizers in Anatomy, how to dissect from part to part, and how studious most ingenuous men are of this Art; as also how mysteriously those that

have

have it doe conceal it, I am, I ſay, provoked to thruſt forth this Work into the world; by the help of which for the three Venters and general parts, and Muſcles of the Body of Man and Woman; as alſo by a little Treatiſe of Maſter *William Molins*, of the Anatomical Adminiſtration of Muſcles, which hee calls MYΣKOTOMIA, (which I alſo commend to the induſtrious Practitioner in Anatomy) I am not ignorant what a great light of experience may bee gained to the diligent hand of ſuch who doe induſtriouſly labour in this Science. I have alſo added a fit Etymon to the names of the parts in their place, from diverſe Authors, beſides thoſe inſerted by this Author, becauſe it is both pleaſant and profitable, and cuſtomably obſerved in Ana-

tomy Lectures. By the help of which Book, I am of opinion, that the ingenuous Chirurgeon may be enabled, not only to Dissect from part to part, but also (where more excellent Physicians are not to bee had) to explain and read upon the parts, to the satisfaction of a Country Auditory; which effects hoping the Lord will crown this work withall, I take leave humbly to subscribe my self,

From my house in Southwark,
Febru. 25.
1652.

A Lover of this Art, and of you all,

Henry Jackson.

To the Reader.

Courteous Reader,

I *Am desired by my learned Friend and Tutor,* M. Mark Franck, *sometimes Fellow of Pembrook Hall,* Cambridge, *to read this Translation of his old acquaintance Master* Jackson, *Chirurgeon, and to write my thoughts, as an Epistle before it; in obedience whereof I shall briefly address my self. I understand the Author to be* Jacobus Carpus Bononiensis (*because of his Figures, as also his mentioning his Commentaries upon* Mundinus) *printed in Latine in the year one thousand five hundred and thirty, about one hundred*

and

and thirty years agoe. Hee was in his time much esteemed for a most industrious, judicious, and expert Anatomist, and hath in this Book given good testimony thereof, for he hath in this Isagoge *exceedingly much improved the* administration *of Anatomy, in many difficult parts of it, which is one of the principal qualifications of an Anatomist; therefore its hoped this Book will bee as well worth the reading as any in that particular, by whosoever that will favour that ever Noble employment and exercise. Moreover, this good old Author is concise and short, without any tedious repetitions, and also writ in an excellent good order and method, and will neither spend time in reading, nor charge considerable. Its hoped the Reader will easily bee perswaded to indulge this Writer with the common abatement ne-*

cessarily

ceſſarily granted to all our ancient Authors.

Firſt, for that he writ ſo long before our for ever renowned Doctor Harvey, *and therefore was not acquainted with thoſe curious truths of the circuit of the bloud, which evidently demonſtrates that the Veins reduce that bloud which was ſent by the Arteries from the Heart abroad into the parts of the Body, and that the Heart with the Bloud and Spirits, is the chief Organ of vitality, the habitacle of the ſpirit of Life, common to us with Brutes: but the Brain, the* Primum ſenſorium, *the ſeat of the Intellect, the complement of man, and the palace of the immortal ſoul.*

The other excuſe to bee entreated for the Author of this Work, is alſo for his age; for hee lived before our incomparable Doctor

Gliſſon,

Gliſſon, *had demonſtrated the true uſes of the Liver; the exact way of Natures making Bloud; the nature and courſe of the Lympha, and the motion of the Chyle; and that the Splene poures no juyce, either ſowre or ſweet into the Stomach: which being ſupplied, our Author may happily paſs compleatly current.*

Formerly Italy *bred many ſuch learned Phyſicians and Philoſophers as this Author, and then it was worth the while to journey to* Padua *to hear them, as other Nations anciently went into Ægypt: But now* England *by the induſtry of* Harvey *and* Gliſſon, *is the only Scene for both; ſo that the politick* Italian, *if he will attempt the attaining to the knowledge of any thing conſiderable in either, muſt viſit* England, *and ours ſtay to better purpoſe at home, unleſs the careful Father ſhall judge*

judge it necessary for the manning his Son, to hazard him such a Pilgrimage as to survey the ruines of old Rome, *and* Campus Martius *the stately place of the new. Lectures upon barbarous* Avicen *will never advance the true worth and knowledge of Physick, nor his Auditors ever admit the truth of the Circulation of the Bloud, whilst they doat upon his third or middle* Sinus *in the* Septum *of the Heart, which this good Author did then deny.*

This Anatomist hath pursued the various ducts of the Vessels, to wit, Arteries, Veines, and Nerves, and also the Muscles, with a notable design, which hath given our later Authors occasion frequently to mention his Labours with honour. This Book, as it is ancient and learned, so it hath been rare to bee found with us; therefore wee owe much to this

Trans-

To the Reader.

Translators industry, who hath rendred it answerable to the Original, and made it both easie for any to be had, and by the vulgar to be understood. I crave your excuse for this freedom, both in commending the Author, and informing the Reader, that hee bee not mislead; as also to adde, that I suppose the word Colligancy *may in some places be read* continuation, *or* connexion, *or* communion, *without wrong to the Authors sense, but in all shall willingly submit, and so conclude*

Feb. 24.
16$\frac{11}{12}$. Tho. Wharton.

De Libello Jacobi Berengarii

ὁ Ἀναγραμματίσμος

Facobus Berengarius
Vis Cibare? Bonus ager } *Anagr.*

Tunè cibare velis? (loquitur Facobus) adesto,
Est bonus (inquit) ager, qui bene pascit oves:
Quem Berengarius duro percussit aratro,
Fructus distribuit, panperis auxilio.

Henricus Jackson.

ὁ Παραφράσης.

Errata.

FOl. 77. for quantiby, read quantity, f. 80. for different Veſſels, r. deferent Veſſels, f. 108. for cancrenated r. cancerated, f. 114. for on the upper part it containeth the Natural members, and on the lower the Vital, &c. r. for on the upper part it containeth the Vital members, and on the lower the Natural, f. 223. for of *Mundinus* is called *inciſui*, r. are called *inciſivi*. f. 247. for endimious r. endemious, f. 249. for and firſt it is to be noted, r. and firſt is to be noted, f. 263. for from which the voyce and conſervation of life rebounderh, r. from which the voyce reboundeth, and it is a conſervation of life, f. 309. for concur, r. occur, f. 313. for ſafety and ſuch like, r. taffati and ſuch like.

A Brief and Practical ANATOMY.

THis Work hath two Parts, the first handleth things Universal, the second things Particular; the first doth (according to the opinions of some) denote *Anatomia* to be derived of ἄνα a Greek word, which in Latine signifieth *per*, and *sursum*, through, upward, a thing truly equal and right, and τομὴ, which is *divisio* or *sectio*, a division or section, as it were a right division through or about the parts.

But by a truer interpretation ἄνα, in composition (amongst the rest) signifieth a certain enquiry made through all the parts, where-

ἄνα Declarat etiam æqualem quandam distributionem. Vi. Scap.

upon in compoſition of this word τέμνω, which is *incido*, to inciſe, it ſignifieth *in ſingulas partes ſeco*, that is, to make inciſion into every part, to the end that we may know what and how many they be: and although it may ſeem reaſon that every thing ſhould bee ſpoken of what parts it hath, yet uſe hath obtained this, that it bee ſpoken of Animals, and eſpecially of men.

Therefore *Anatomia*, or *Anatome*; Anatomy, is a diviſion of all the parts of a living Creature, that wee may know their Subſtance, Quantity, Number, Figure, the Situation, and Colligancy of them, and all theſe are in dead bodies; and therefore *Galen* ſaid in his Book of the Conſtitution of the Art of healing, *I think it were neceſſary for us when we intend this Art, not only to know the parts and their compoſition, but their operations alſo*; and in this Phyſicians do differ from Builders, for they doe only know the parts and compoſitions of Houſes, whereof none hath operation, becauſe it is not a living Creature; but

Colligantia from *Colligo, as*, is ſuch an affinity of the parts, as is by being tied or faſtned to one another.

but by Physicians, of the members of man, insomuch as he is a living Creature, operations are to bee sought; and because that in a living man, and not in a dead, there are Operations, Complexions, and Passions, so that these three being added to the other six, there are in a real Anatomy those aforesaid nine things to be considered.

But because we must begin from the whole as being best known; First, some dead body being laid with his face upward, in a place fit for dissection & demonstration, being before washed, the hairs shaved, and very well cleansed from filth, even from the head to the feet; we must know, that the body is divided into four parts, that is, into three notable Bellies, and the extreams, to wit, the hands and the feet, with some others.

The first part being the Head is *Testa*, an earthen pot, called in Latine *Caput, quia ibi sensus initium capiunt*, because the Senses take their beginning there; in which the Animal members are contained;

and this is called the higheſt Belly.

The ſecond part is a Cavity between the ribs and the bones annexed to them, in which there are principally the Spiritual or Vital members, and ſome others; and this is called *Pectus*, and *Caſſus*, the breſt, and the middle belly.

The third part is the hollowneſs which is within the *Abdomen*, and part of the Back underneath the *Septum tranſverſum*, otherwiſe *Diafragma*, and goeth down before unto the *Pecten*, and behind unto the *Anus*; in which the Nutritive members, and alſo the Generative are partly contained; and this is called the lower belly.

The fourth part is the whole reſidue of the body, as the neck, the hands, and the feet, and parts that belong unto them.

Of the Anatomy of the lower Belly.

THe univerſal part being ſeen, I come to the particular, in which the Work-man muſt begin his

his inciſion from the lower belly, wherein there are many members firſt to be Anatomiſed and caſt away, leſt if they bee left behind, they ſhould hinder the reſt of the body by their putrefaction and evil ſavour.

Therefore let this Belly be conſidered according to the nine aforeſaid conditions: and firſt for the Subſtance which is diverſe, as well according to the parts Containing, as the parts Contained; the Subſtance of the parts Contained will appear in its place, but the Subſtance of the parts Containing in the former and lateral part is Pannicular and Muſculous, that it may bee fit for Conſtriction and Dilatation, becauſe of impregnation, and food, and the like. There is alſo notable fatneſs in theſe parts in a fat Body, but in a lean body little, and ſometimes none at all; and fatneſs is not properly a member, but increaſing and diminiſhing as a ſuperfluity, nevertheleſs profitable.

But the hinder ſubſtance of this belly is fleſhy, muſculous, bony,

and also somewhat membranous.

Its Quantity and Figure are apparent, its Situation and place is under the belly of the Vital members, the *Septum transversum* being between; and it beginneth from the lower *furcula* of the Breast, and from the bounds of the five lower Ribs on both sides, and goeth unto that part in which the body is divided into two parts by the great Feet to which it is fastned; it hath Colligancy with the Brain by means of the Nerves, and with the Heart by means of the Arteries, and with the middle Belly by some Muscles; the Colligancy that it hath with the Liver, and with the members of Generation is sufficiently known,

The great foot is the whole thigh, leg, and foot, from the groyn downward.

It is in Number one Belly, yet the number of the parts of it is diverse, because some are Contained, and some Containing; the parts contained are the Liver, with its little Cystern containing Choler, and the Spleen, and the *Ventriculus* called of many *Stomachus*, although

though not well; also the six Intestines with the Veins dispersed through them, and the Reins with their Emulgents, and the Bladder with the Uritidian pores, which are called the Emunctories of the Reins, and the *Mesenteron* with his glandules, and the *Vena Porta*, and *Vena Chylis* descending with the *Arteria Aorta*; and also the Umbelical veins and Arteries, and the Seminary vessels, with the Didimies, and Testicles, and the Matrix in a Woman; and although the Didimies and Testicles, with their *Scrotum* or *Oscheon* may bee exteriour parts, yet they are reckoned within that Belly, because they are immediately fastned unto it.

But of the parts Containing, some are Common, some Proper, and some more proper; the Common are all those parts which compass about that Belly, to wit the Anteriour, the Lateral, and the Posteriour parts; the Anteriour or Lateral parts are called in Latine *Sumen*, but by antiquity *Abdomen*, in Greek ἐπιγάστριον, and of some

Epigastrion.

Etron. some ὑπερον, and in Arabick *Mirach*; the Posteriour are called *Imum dorsi*, the bottom or lowest part of the back.

But the parts Proper, some are also before, some on the sides, and some behind; those which are before, of the latter Physicians are commonly appointed five; the first which is the highest is in the middle of the Body, about the lower *furcula* of the Brest, and is called *Gladialis, & scutalis cartilago*, and also *Pomum granatum*; but this part is common both to the middle, and to the lower belly, taking up but little room.

The second immediately under that is called *Pars stomachalis*, the region of the Stomach, because the stomack, that is the Ventricle, hath its former part in that region, and this part reacheth unto the Navel.

The third part is called *Umbilicalis*, and it is that part in which the Navel is enclosed in the middle of the *Abdomen*, which is now frustrate from his principal function in a childe. The

The fourth part is called of *Mundinus*, *Sumen*, becauſe it is the moſt eminent part of the very *Sumen*, and there the part is taken for the whole; this region is from the Navel unto the *Pecten*. *Synecdoche partis.*

The fifth part is called *Pecten*, within which is the *Os pubis*, or *Pectinis*, in that region there beginneth the neck of the Bladder in both Sexes, and of the Matrix in a woman.

The Lateral parts, as they are equally divided on both ſides, are of Phyſicians commonly ſaid to bee two, to wit, the Superiour, and the Inferiour; the ſuperiour is called *Hypochondrium*, the Inferiour is called *Ilium*, or *Flanens*; the *Ilia* are alſo called *Lagones*, & *Ceneones*; in the right *Hypochondrium* is the Liver, but in the left the Spleen; the upper part of the *Ilia* beginneth from the top of the *Os ancharum*, and endeth about the bottom, in the extream part of this Belly; their loweſt part is called *Inguen* & *bubo*, but the *Hypochondria* doe begin from the loweſt of the falſe ribs, Λαγών *Laxa ſignificat.* Κενεών, *vacua ſignificat.*

ribs, and are terminated below at the *Ilia*; between the *Ilia* and *Hypochondria* there appeareth a certain cavity when a man bendeth himself forward, which of some is called *Colago*, and of some *Intrum*.

The parts properly called the Posteriour, some are in the middle, and some on the sides; those which are in the middle are *Spina inferior, & filum inferius dorsi*, the lower spine, and line of the Black.

Of the Lateral parts some are Superiour, and some Inferiour; the Superiour are called, *Regiones Lumbares*, or *Renales*, the regions of the Loyns or Reins; the Inferiour are called *Partes supra clunes*, the parts above the Buttocks

But the parts called more Proper, some are also Anteriour, some Lateral, and some Posteriour; the Anteriour and Lateral parts happen together, and they are that skin which you first meet withall, under which there is Fatness, and eight Muscles; of which four are oblique, two long, and

two

wo broad; all which are dilated, nd united to the likeneſſe of a annicle, which may be called, and ndeed is called of *Avicen*, *Panniculus Carnoſus*, the fleſhy pannicle; neither is there any other fleſhy pannicle there, as late Phyſicians doe ſuppoſe.

Under the Muſcles there is a membrane ſubtile and hard, called in Greek περιτόναιον or περιτόνειον, *Peritonæion* and in Arabick *Sifac*; and all theſe doe make the *Abdomen* or *Mirach*.

But the Poſteriour parts called alſo more Proper, are the Skin, ſometimes ſome Fatneſs, and a muſculous fleſh on both ſides of the Spondiles, to wit, before and behind, called of ſome *Lumbaris*, and a ſimple fleſh not muſculous, filling the empty places of this part; and the ſpondiles of the Reins or *Alkatim*, and three bones of the *Os ſacrum*, or the three Spondiles, called in Arabick *Alhovius*, and the three Spondiles called *Alhoſos*, or *Caudæ*; alſo their Cartilages, with their Pannicles, and Nerves, Veins, and

and Arteries, with the pannicle *Peritonion*; the Anatomy of those parts shall bee spoken of in their place; but now I return to the Anatomy of the *Abdomen*.

Umbilicus quasi umbo iliacus quod ibi fit iliorum umbo. Græ. Ὀμφαλός.

Of the skin of the lower Belly, and of Umbilicus the Navel.

YOu shall first consider the situation of the Navil, which is termed the root of man; which hath two veins without the body toward the Matrix, and very often one; and two Arteries covered with the superfluous skin; which in Children new born is tied up, and cut near unto the *Abdomen*, and is consolidated and shut up again it self; the middle part of it thus consolidated is called *Acromphalum*, and because it is wrinkled it is called *Vetula*, and in Greek γραῖα; Graica. these things being noted, cut the skin in the manner of a crosse in length and breadth through the whole *Abdomen*, and excoriate it, reserving the Navel unhurt, which you shall very often perceive entring

tring into the belly with one notable Vein and two Arteries, which are fruſtrated from their proper work in Children; the Vein is aſcending, penetrating into the concave of the Liver in the *Vena porta*.

The Arteries deſcend by the inward part of the *Abdomen*, almoſt unto the *Pecten*, and they paſs unto the back from the ſides of the Bladder, and are implanted, one on the right ſide, the other on the left into the *Arteria aorta*, which is two-forked about the *Os ſacrum* near the Reins.

From thoſe Veſſels the bloud and ſpirit doth paſs to the Liver, and Heart of an infant in the Mothers womb; but you ſhall ſee the Navel better after the Anatomy of the *Abdomen*, which you ſhall careſully reſerve, obſerving the skin which is two-fold; the firſt is the Exteriour, which is a groſſe ſuperfluity of members, and therefore it groweth again; the ſecond is the Interiour, which is nervous, not growing again, under which or within

within which, about the sides, there are in both Sexes two Veins, one on the right side, another on the left, hardly to bee seen in one that is born, but in a *fœtus* of three months they doe very well appear, which doe ascend unto the *Mamillæ* or Teats, which observe and keep for the Anatomy of the *Mamillæ* or Teats, especially in a Woman.

But in the whole skin of the body there are very small veins dispersed into *fibraes*, and they are so small and narrow that the bloud cannot pierce through them, nor any thing else but a banished humour which is called Sweat, and the Serosity of the bloud.

Whey-ishnesse.

Of fatnesse, called pinguedo.

Pinguis dicitur quasi πιωνγήιος πίων α πίωμα το & γήιος tertenus.

After the Skin there is alwaies some fatnesse, especially in a body not brought down by sicknesse, more in one than in another, which remove, that the members contained under it may the better be seen.

Of

Of the Muſcles of the lower Belly.

Muſculus a murium ſimilitudine.

AFter the Fatneſs are to be ſeen eight Muſcles of the *Abdomen*, of which firſt of all four named obliques doe occur; two of them are placed on the right ſide, and two on the left, which doe cover all that belly before with their Chords, from the top to the bottom, and doe ride over all the other; for in each ſide of the belly, and before in the middle of the *abdomen*, one of them is deſcending, and one aſcending; the deſcendent are above the aſcendent, which you may ſee being guided by a learned hand.

Firſt, you ſhall warily ſeparate the deſcendent from the aſcendent, and you ſhall find them in each ſide of the belly to bee croſſed of one another, one croſſe is on the right ſide, another on the left; their fleſhy part doth mutually croſſe it ſelf, even as the ſinewy or Chordy part alſo doth croſſe it ſelf;

ſelf; their fibers doe alwaies reach obliquely from the ſides toward the middle of the Belly, therefore the Chords of thoſe muſcles of the right ſide, doe reach unto the left part of the ſame right ſide; and the chords of the muſcles of the left ſide, do reach after a contrary manner: for their own proper chords doe in each ſide croſſe one another.

And the Oblique muſcles begin to make their chord when they meet with the Long muſcles; and the chords of the Muſcles of the right ſide, and alſo of the left are terminated when the long muſcles are contiguous, which place is in the middle of the belly, by the *Linea recta*, from the *Pomum granatum* unto the *Peeten*.

The Deſcendent take their beginning from the breſt, the Aſcendent from the upper and anteriour region of the *Oſſium ancharum*; their Chords are double coated, and very broad, hardly to be ſeparated, having their beginning from the pannicles covering them, and from the nervous vills through them diſperſed.

The first figure of Muſcles

Place theſe ſix figures betwee ne the 16. and 17. page

The II figure of Muſcles

The III figure of Muſcles

The IIII figure of Muſcles

The V figure of Muſcles

The VI figure of Muſcles

Two coats of the Chords of the descendent Muscles on both sides, and one coat of the Chords of the Muscles ascendent doth cover over the long muscle of his side from the top to the bottom; also one coat of the Oblique muscles doth cover or involve the long muscle of his side toward the bottom, that is toward the Chord of the Broad muscle; because the long muscles, have not a proper pannicle covering them, as the sense sheweth; and you may very well see the aforesaid oblique muscles in the three figures immediately following; but observe all their ligaments diligently in your incision, which you may not take quite away (unlesse those which are over the long Muscles) but those which are under the Long muscles are to bee kept until you have anatomized them.

The first Figure of Muscles.

In this Figure you have two Oblique Muscles descending, one on the right side, another on the left,

which are above all the Muſcles; the fleſhy part of them appeareth on the ſides, and in the middle of the belly, their Chords are above the long Muſcles, to wit, one on the right ſide, another on the left, which are pellicular and broad, which are terminated in the *Linea*, which is in the middle of the belly, as you ſee, and thoſe ligaments are of the two Pellicles, to wit, below and above.

The ſecond Figure of Muſcles.

In this Figure you have two Oblique Muſcles aſcending, which doe croſs themſelves with the two deſcending placed in the other Figure, which deſcendent are indeed above thoſe aſcendent; and one whole Muſcle of the aforeſaid deſcendent (placed above in the other Figure) doth with his Chord obliquely ride over one of thoſe oblique aſcendent Muſcles, and they together make the ſhape of x the Greek letter; and the fleſhy part of thoſe Muſcles is alſo on the

ſides

ſides, but their Chords are in the middle of the belly, which are alſo of the two Pellicles, and they have one Pellicle only over-riding the long Muſcles, but the other Pellicle is below the long Muſcles, which cleaveth to the Chords of the latitudinal Muſcles; and thoſe Chords are alſo terminated in the *Linea*, which as you ſee is in the middle of the belly.

The third Figure of Muſcles.

In this Figure you ſee how the Long Muſcles being taken away, under them there is one Pellicle which is of the Chord of the Oblique Muſcles, which hath Oblique Vills, and there is one under each Long Muſcle, as you ſee in this Figure, and the Long Muſcles are thoſe which hang between the thighes, that they may appear taken from their Natural place, that the Chords of the aforeſaid Oblique aſcending Muſcles might be ſeen.

Of the Long Muſcles.

THe Long or right Muſcles are two, placed in the middle of the *Abdomen*, below and above the Chords ſpoken of before, reaching with their Vills from the lower *furcula* of the Breaſt through the length of the belly unto the *Os Pectinis*, and they are therefore called Long; they touch one another, taking up the anteriour part of the belly in breadth, being in the quantity of their breadth in all eight fingers or thereabout; thoſe Muſcles have not a proper pannicle as others, yet they have ſhort Chords terminated in the *Pecten*, and they have not any other Chords; their ſubſtance is fleſhy, and divided through the breadth by two ſinowy or ligamental intermedians, whereof one is above the Umbelical region, the other below, ſo that every Muſcle ſeemeth divided into three fleſhy parts notably diſtinct; as you may ſee in the Figure following.

The

The fourth Figure of Muſcles.

In this Figure you ſee two Long Muſcles ſtripped from the Chords of the Oblique muſcles, which Long muſcles are above the ligaments of the Latitudinal muſcles, and every Muſcle hath two ſinowy or ligamental diviſions in it, reaching through the breadth; to wit, one above the Navil, and another below, as you ſee; and ſo every Long muſcle ſeemeth divided into three Parts, or into three Muſcles; and Nature hath done this, becauſe by how much the threeds of the Muſcles are ſhorter, by ſo much they are the better, and more eaſily contracted.

Of the Broad Muſcles.

THe aforeſaid things being ſeen, you may caſt away as well the Oblique as the Right Muſcles, that you may the better ſee the Broad, which with their Chords are under the Long muſcles (one

of the coats of the Chords of the Oblique aſcending muſcles coming between them:) which obſerve with diligence after the Long muſcles are removed, which tunicle is very ſubtile, notably faſtned to the Chords of the Latitudinal muſcles; the Broad muſcles have their fleſhy part under the fleſhy part of the Obliques, and they are called broad, becauſe the poſition of their Vills is through the breadth of the belly, and they are more above the Umbelical region than below, becauſe their principal operation is from the upper parts to the lower, which is to help the expulſive virtue of the Inteſtines; the fleſhy part of them is towards the back, they are terminated into Chords in that region, where the ſituation is of the Longitudinal muſcles, and the Right meeteth with the Left his Chord being between; their fleſhy part is under the fleſh of the Obliques, and their Chords are immediately under the Chord of the aforeſaid Oblique aſcending muſcles; thoſe Chords alſo are very broad,

broad, and alſo double coated and hard, compact together, faſtned to the pannicle *Peritonion* or *Sifac*, and their Chords doe croſſe themſelves with the Long muſcles unto right Angles.

The ſituation of the Muſcles of the lower Belly appeareth by that which hath been ſaid; their ſubſtance, their quantity, and their ſhape is to be ſeen; in number they are Eight, four Oblique, two Long, two Broad; their Colligancy is ſhewn, for they are very firmly chained together, and they are ſo united that they are judged one pannicle, which is called *Carnoſus*, the Fleſhy Pannicle; their complexion in a live man appeareth by their ſubſtance.

The helps of them are to keep the Inteſtines warm, and to hold in all the united members of nutrition, and to help the retentive vertue, but chiefly the expulſive, and ſometimes they help the members of breathing, eſpecially in * *Flamine cum ictu*, in a Blaſt with a ſtroke or noyſe, and in a violent expiration:

* See *Galen* in 4° *interior* c. 15. where hee maketh mention of five operations of breathing, whereof this is one.

on: they may ſuffer paſſions of all ſorts.

You ſhall ſee the aforeſaid Muſcles in the firſt Figure following, and in the ſecond Figure you ſhall ſee the ſituation, place, and alſo the ſhape of the eight Muſcles of the *Abdomen*, or *Epigaſtrion*, otherwiſe *Mirach*; but hee which intendeth better to ſearch into theſe Muſcles, and many other things, let him have recourſe unto our Commentaries upon *Mund.* the envie of whoſe labour ſhall affect me after death.

The fifth Figure of Muſcles.

In this Figure you have two Broad muſcles, above which were the Long and Oblique muſcles, which are now taken away from them, as you ſee, and the fleſhy part of thoſe Latitudinal muſcles is on the ſides, but the Nervous part of them (to wit, their Chords) is in the middle of the Belly, and they are compounded of the two Pellicles, that is of that below and a-

bove,

bove, and they are faſtned with the pannicle *Siphac*, and thoſe Muſcles are more in the upper part of this belly than in the lower, as you ſee, that they might the better expel downwards, that which is in the Inteſtines.

The ſixt Figure of Muſcles.

In this Figure are three kinds of Muſcles, to wit, Oblique, Long, and Broad, and you have in the right part two Muſcles, which are not covering the whole right part, as they doe naturally, and as it is ſhewn in the firſt and ſecond Figures, and they are ſo made in this place, that the croſſing of them may the better be ſeen; but in the left part you have one Long muſcle, and one Broad. of which Broad the fleſhy part doth only appear, but the Chord of that Broad muſcle is under the Long muſcle afore ſpoken of.

Of

Of the Peritonion or Siphac.

THe aforesaid things being seen, remove carefully the Chords of the Broad muscles from a membrane annexed to them towards the Intestines, which is subtile and hard, named *Peritonion* and *Siphac*, this compasseth all the vacuity of the lower Belly round about; it is round, but not perfectly, its substance is Nervous, and hard, its shape is spoken of.

περιτόνειον ἀ περιτείνω, *Circumtendo, quia circum intestina circumtenditur.*

From that Pannicle doe arise two Purses or Baggs, in which the two Testicles are placed within the *Scrotum*, which are parts of the same *Scrotum*; its quantity is so much as is the vacuity of the lower belly, its situation appeareth; in number it is one pannicle only; its Colligancy is with the Broad muscles, and with all the members contained in that Belly; and all the members of this Belly, have a proper Pannicle involving them, arising from this *Peritonion*.

It hath Colligancy, (according to

to *Avicen*) with the *Pleura*, it hath alſo Colligancy with the *Septum tranſverſum*, and with the Teſticles, its complexion is the ſame which is of other Pannicles.

Its Helps are to faſten the members of Nutrition, and Generation, to the Back, and to warm the Inteſtines, and to keep them from Rupture, and it is to hold them from going out of the belly; it helpeth alſo (together with the *Septum tranſverſum*) the expulſion of that which is contained in the Ventricle, and in the Inteſtines, and in the Matrix.

It ſuffereth Paſſions of all ſorts; its proper Paſſion is Rupture and Mollification; look for the cure of them all ſomewhere elſe, becauſe in the demonſtration of Anatomy, it is not convenient to put the cure of Aſcites, neither the cure of wounds of the *Abdomen*, nor of the Inteſtines, nor the manner of gelding, nor drawing out of the ſtone (as *Mundinus* hath done) neither alſo of any other diſeaſe: yet wee will ſay ſomewhat of the Flebotomy of the

Veines

Veines of *Guidez*, and perhaps some other special things.

Of the Omentum or *Zirbus.*

Omentum dic. quasi opimentum, ex opimus, vel ab omen, quod ex omenti inspectione ominarentur.

THe members spoken of are to bee cast away, that the rest of the members may the better bee seen; and first cometh the *Zirbus* or *Omentum*, called of the vulgar sort *Rete*, a Net, or Caul, which is a member compounded of two very thin sinewy Pellicles, with much fatness annexed to it.

This member hath many pulsant and quiet Veines, but more manifest in a lean body, than in a fat; its Pannicles are discontinued throughout, unless about the circumference of it; it beareth the form of a Pouch or Bag, for between those Pellicles there is a very great hollowness.

Its substance hath been spoken of, it Colligance is with *Siphac*, with *Colon*, and with the Spleen; its situation is towards the fore-part, reaching over the Intestines from the Ventricle unto the *Inguina*; the quan-

quantity of it may bee ſeen; it is in number onely one member; its ſhape is handled, its complexion is the complexion of the parts of which it is compounded: its helps are to help digeſtion, and to mollifie the dregs: it may ſuffer paſſions of all ſorts; it cauſeth the *Ramex* in the *Scrotum*, in the Navel, in the *Inguina*, and in other places of the *Sumen*, if the *Peritonion* bee broke or mollified.

Of the Inteſtines.

REmove the *Zirbus*, and you ſhall ſee the Inteſtines, which are continual from the Ventricle unto the *Anus*, they are revolved to and again, that they might retain the meat a long time for a good end, and they are ſix in number. *Inteſtinum quod intus in ventre continetur.*

The firſt beginning with the loweſt is *Rectum*, of the length of a Palm, or thereabouts.

The ſecond is *Colon*, which aſcendeth by the left ſide, unto the Region of the Kidney, and Spleen,

and

and from thence it passeth from the left side unto the right, riding over the Stomach, and in the right side it is united to the intestine *Saccus* situated about the highest part of the *Os Anchæ*.

This Intestine called *Saccus* or *Cecus* is to be reckoned the third in order, and these three are said to be of a gross substance, for they are fleshy, and they may bee consolidated if they receive solution.

The fourth is the long Intestine called *Ileon*, and *Revolutum*, or *Involutum*, because it is on both sides revolved throughout the Belly.

In the fifth place is *Jejunum*.

In the sixth, *Duodenum*, and these three are subtile, called of some *Lactes*; the solution of which, if it bee notable, is not consolidated: The uppermost are subtile by their Colligancy, and the lower gross; all of them have two Tunicles, and a common Pannicle coming from the *Peritonion* covering them over, and fastning them to the Back.

In the inside of them there sticketh

sticketh Pituity or Flegm to resist corrosion, and to make slippery the dregs; in them there are fibres of all sorts, but most broad; their complexion is cold and dry: & the small are colder than the gross, because their substance is Nervous: and in the gross there is some flesh; their shape is apparent; their particular situation hath been, and shall bee laid open by that which followeth; their Helps are known; they suffer passions of all sorts.

For the seeing of the particular Anatomy of the Intestines, first observe with diligence the situation of them, and before you separate them from the *Mesentereon*, consider their Veines, which are called of some *Lactes*, which do transport the *Chilus* to the *Vena Portæ*, in the very small branches of which beginneth sanguification, by the help of the Liver; note also the situation of the *Vena Portæ* which is without the concave of the Liver, reaching with eight branches towards the Intestines, and towards the Stomach,

the

the *Omentum*, and the Spleen, all which obſerve with diligence, if you can, before the Inteſtines bee caſt away.

Of the Inteſtine Rectum.

Rectum quia aſcendit recte.

THeſe things being diſpatched, firſt wee muſt ſee the *Rectum*, or *Longaon*, which is to bee cleanſed from the filth, driving it with your hand into the *Colon*: and its extream part towards the *Colon* is to bee tyed in two places, and to be cut between the Ligatures; for its ſituation is from the *Anus* aſcending to the upper parts through the belly, about the length of a Palm, having few Miſeraick veines, becauſe that which it containeth nouriſheth but a little; it is terminated about the left *Ilium*, where the *Colon* beginneth, the *Rectum* beinguunited thereunto.

Of the Inteſtine Colon.

χῶλον *dictum quaſi* κοίλον *Cavum.*

YOu ſhall obſerve the *Colon* to bee placed in the left ſide, and it

it ascendeth about the left Rein, and there it is strict, that it might give place to the Spleen, which it covereth, and to which it is fastned: it reacheth from hence to the right side, and doth ride over the Ventricle, and is fastned unto it: hence is caused the departing for a time in a *Syncopis*; hence doth its pain increase after meat is eaten; but the grief of the Reins groweth in the second digestion; it is fastned to the *Omentum*, of which, and also of the Ventricle it is moistned; it is covered with that *Pennula* of the Liver, in which is the *Cistis Bilis*, the Gall, and therefore it is very black and bitter: it is vauted or celled, and Pituity aboundeth there.

In it are ingendred *Cucurbitines*, and also other Worms: in it also the Ordure doth obtain an unequal shape: there is in it a rumbling a little before the time of feeding.

It is thus situated that the weight might the better descend from the upper to the lower part: and by

its ſituation to have the keeping of Cliſters, and the places of applying Medicines in the Colick; its quantity is to bee ſeen; its ſubſtance is a little fleſhy; and it is ſinowy and fat, and ſolid, that it may reſiſt hard and ſharp matters; it hath alſo notable miſeraick veins through which the *Chilus* and blood doth paſs.

Its proper paſſion is a windy pain; in it there are bred ſtones, and skins by aduſt flegm.

Theſe things being ſeen, you may ſeparate the *Colon* from the *Meſentereon*, to which it is faſtned, and let alone the *Rectum* in its place, until the Anatomy of the *Anus*, which cannot bee perfectly ſeen, but when you make Anatomy of the *Virga* and *Veſica*.

Ex ſacci ſimilitudine It is called *Cecus* blind, and *Monoculus*, one eyed, becauſe it hath but one orifice.

Of the Inteſtine Saccus.

TO this Inteſtine about the *Os Anchæ* beneath the Kidney in the right ſide is placed an inteſtine called *Cecus*, *Saccus*, and *Monoculus*, becauſe it hangeth like a ſack

ſack, and it hath but one Orifice, by which it draweth and expelleth the excrements, but in certain hours it draweth from the *Ileon*, and driveth it into the *Colon*; in this there is a greater digeſtion than in any other Inteſtine, for it is a ſecond Ventricle, firſt it draweth, next it digeſteth, and afterwards expelleth unto the *Colon*.

Its quantity is about a palm in length, but it is as broad as *Colon*, and alſo more, it is not faſtned to the *Meſentereon*, but hangeth in the belly; in it are bred worms called *Serpentes*.

But this Inteſtine is often found fruſtrate in nature, becauſe it doth none of the aforeſaid things, and then it is alſo found faſtned to the Inteſtine *Colon* and *Ileon*, and it is as it were a certain additament, and its ſhape appeareth ſtrictly compacted, but within it is empty, and is leſs in breadth than the leaſt finger of the hand, and it is of the length of three inches or thereabouts.

Of the Inteſtine Ileon.

ἰλέον dic. ab ἰλέω in arctum cogo.

TO this Inteſtine *Saccus* going upward is immediately faſtned the firſt of the ſlender Inteſtines called *Ileon*, and *Longum*, and *Revolutum*, or *Involutum*, whoſe ſubſtance is ſlender; its ſhape is very long and round; its quantity is longer than all the other Inteſtines together; there are more Miſeraicks in that Inteſtine than in any other, becauſe of his length; its ſituation is more about the *Ilia*, yet it is in other places through the belly; it is faſtned to the *Meſentereon*, from which it muſt bee ſeparated that you may well obſerve the other upper Inteſtines. Its proper paſſion * is *diſpoſitio Iliaca*, and the paſſion called *Miſerere mei*, in which the ordure paſſeth to the mouth.

Hic morbus dicitur ἰλεός *ab* ἔλεος *misericordia quia miſerandus dolor.*

Of

Of the Inteſtine Jejunum.

TO this *Ileon* is continued the ſecond ſmall Gut, called *Jejunum*, *Hira*, *Hilla*, and *Sterilæ*, or *Vacuum*, and it is empty, becauſe it is near unto the Liver by whom it is emptied, by drawing *Chilus* from it, and by expelling that which is contained in it, by means of Choler from the *Ciſtis*, entring into it about the *Duodenum*: it hath more Miſeraicks, than any other Inteſtine like unto it in length, that they might quickly ſuccour the Liver, yet it is emptieſt in the upper part about the *Duodenum*, and it is not altogether ſtreight, but beginneth to bee revolved where it is faſtned to the *Ileon*, and therefore it is partly ſtreight, and partly involved; it is of a Citron colour, becauſe it is near the Liver; in ſubſtance and ſhape it is like to *Ileon*; its quantity may bee ſeen, but it is not much, and its ſituation is about the region of the Liver, and ſomewhat below,

Jejunum ſignifies hungry, empty, or barren, becauſe this gut is alwayes found empty.

low, but in the middle of the belly.

These things being seen you may also excarn this Intestine from the *Mesentereon* that you may the better see the *Duodenum*, which you shall know in his longitude from the stomach below, to bee in quantity as much as are twelve fingers in breadth from the stomach downward.

Of the Intestine Duodenum.

δωδεκαδάκτυλον *a duodecem digitorum longitudine*

IN the last place is to bee seen the highest of the small Guts, called *Duodenum* and *Dodecadactylon*, whose quantity in length appears above, and in breadth is less than every other Intestine, and is as much as the lower gate of the Ventricle, called in Greek πυλωρὸς, and in Latine *Janitor*.

The substance of it is slender, it is not revolved, but streight, fastned to the Ventricle towards its upper part, and it is fastned to the *Mesentereon*, also about the *Jejunum*, it is fastned to the *Cistis bilis*

bilis, by the Chanel which conveyeth choler for the cleansing of the Intestines from flegm principally, and from excrements.

That Chanel entreth Diagonallically in that Intestine between * a Tunicle, and a Tunicle, lest the Choler, and perhaps *Chilus* might again ascend unto the *Cistis*.

* Or between the two Tunicles.

Consider that Chanel warily, and keep it for the Anatomy of the aforesaid *Cistis*; the helps of this Intestine are to take from the Ventricle things digested, and to send them to the other Intestines; it suffereth every kinde of disease.

Of the Mesentereon.

THese things being seen, divide the *Duodenum* below the pore coming to it from the *Cistis bilis*, binding it first, lest that which is contained in the Ventricle go forth; and you may put away the other Intestines when you have first warily excarned them (as it is said before) from the *Mesentereon*,

μεσεντέριον *quasi* μέσον ἔντερον, *quia medium inter intestina situm obtinet.*

or *Entarus*, which of ſome is alſo called *Lactes*; this member is placed among the very Inteſtines, faſtning them in their Center to the back; and it is compounded of doubled Pellicles of fat, and of Glandules, in the which there are many veins proceeding from the Liver, which are commonly called Miſeraicks, and of *Galen* are called the hands of the Liver, becauſe they ſnatch from the Inteſtines the matter of blood, and give it to the Liver; thoſe veines are of the branches of *Vena portæ*; in this member there are alſo ſome Arteries.

This member is divided into two parts; the firſt is faſtned in the upper part to the *Jejunum* and *Duodenum*, which is very glandulous, and its Pellicles are ſingle; the *Venæ portæ* do paſs thorow that part to the Ventricle, to the Spleen, and to the *Omentum* this part in a Hog is of a ſavoury taſte, and is commonly called the Sweet-bit, and alſo *Briſaro*, and *Bocca ſaporita*; In thoſe great Glandules

is sometimes contained a matter causing a sickness, which is called *Melancholia Mirachia.*

Another part of this member is fastned to the other Intestines, whose Pellicles are doubled, because they fasten great members to the back; and this second part is esteemed of all men for the true *Mesentereon*; those two members are nourished from the veins of the *Porta.*

Their quantity and shape appear, the first is lesser than the second, their complexion is cold, they have colligancy with the back by means of *Siphac*; their helps are to fasten the Intestines to the back, and to sustain the Miseraick veins, and other veins of the *Porta*, and to moisten the dregs of the Intestines.

In number they are two members, even among the vulgar; they may suffer diseases of every sort; this member or members is to bee let alone in its place, untill the Anatomy of the veins of *Porta* bee seen.

Of

Of the Ventricle, which is commonly called the *Stomach*.

Ventriculus venus dic. στόμαχος enim idem eſt quod Gula.

THe *Meſentereon* being diſpatched, blow up the Ventricle through the *Duodenum* left afore, as much as you can, that the chiefeſt greatneſs of it may bee ſeen, then you may reduce it to a mean inflation, that other things requiſite in it may the better bee ſeen.

And firſt you ſhall obſerve its place, which is in the middle of the whole body, the extream parts excepted, and it is immediately under the *Septum tranſverſum*; on the right ſide it hath the Liver, and on the left the Spleen, under it the Inteſtine *Colon*, and other Inteſtines, before the *Omentum*, and *Abdomen*, behindethe back, and the parts contained therein; its ſituation is oblique, faſtned to the back under the *Diafragma*; its upper part is in the left ſide, that it might give way to the Liver, which is in the right, and placed on high:

nigh : and that melancholy might the more easily go from the Spleen to the mouth of it : the lower part of it is in the right side, that it may give way to the *Colon* which is in the left taking up a great room; but its lower part in the right side towards the *Portanarium* or gate, is less than in the left side toward the *Colon*, because in the right side the Liver taketh up a greater room than the *Colon* placed in the left; also its lower part is in the right side, lest otherwise the Orifices should bee direct, both that the meat might bee the better retained, and that the Choler from the gall might the more easily enter into the *Duodenum* continued to the lower part of it.

Its substance is nervous, by predomination, its colour appears, its shape is round, arched after the manner of a * *Mores* Goard; its quantity is apparent.

* Or *Moresan.*

It hath Colligancy with the heart by Arteries, with the Liver and Spleen by veins, with the Brain by the descendent nerves; it

is

is faſtned to the *Anus* by the Inteſtines, and to the mouth by means of the *Gula*; it is faſtned to the *Zirbus* toward the former part; it hath two Tunicles, the innermoſt is more ſinowy by reaſon of the appetite, and more groſs rugged and hard, becauſe it meeteth with hard meats; it is harder in the upper part, and alſo more ſenſible; it hath an outward Tunicle more ſubtil enclining a little to the nature of fleſh; the innermoſt is ſome way nouriſhed by the *Chilus*; the outermoſt is nouriſhed by *Vena portæ*; the innermoſt hath towards its inſide long fibers ſerving for attraction, and towards its outſide it hath oblique fibers for retention, the outermoſt hath broad fibers for expulſion.

The bottome of it ſerveth for the digeſtive faculty by means of the outermoſt Pannicle, and by means of the heat of thoſe part; which are about it, yet it hath a proper hidden vertue of digeſtion, as the Matrix of generating, and

the

he Liver of making blood; the pper part of it ſerveth for the ppetite by the help of melan-holy, milking it ſelf into its nouth from the Spleen, and for his cauſe it is often found black.

The Ventricle hath alſo a com-non Tunicle involving it, and aſtning it to the Back ariſing from he *Peritoneon*, which is groſſer han any other member con-ained in the lower belly, except he *Meſentereon* in that part vherein it is doubled, and it is ſo n the Ventricle becauſe of the ex-enſion that it hath in victuals.

The body of it is faſtned with its pper Orifice to the back, to wit, etween the twelve and thirteenth of the Spondiles of the back, which Orifice is properly called the Sto-nach, and there are applied Me-dicines for the comforting of the ppetite, and this Orifice is in the very lower part of the *Gula*, or *Meri*, which by penetrating the *Diafragma* is continued upwards o the extream part of the mouth eſpecially with its innermoſt Pan-

pannicle) and this Orifice is ſhut up by the *Diafragma*, leſt in the inclination of the body the meat might eaſily return back; it is alſo faſtned to the back by its lower part, that is by the *Pyluron*, or otherwiſe *Pyloron*, or *Portanarium* in that place where the *Duodenum* is faſtned to the back by the *Meſenterion*, but the reſt of it is looſe, and is eaſily moved any way; this *Portanarium* is higher than the bottom that contains the food, leſt the meat might too eaſily fall downward.

In number it is one member; its complexion by the parts compounding it is cold and dry.

Its helps are to cauſe appetite, to retain, and to concoct the food, and to give the groſs part to the inteſtines, but the good and digeſted to other members by means of the Liver.

It ſuffereth paſſions of all ſorts, and through the great ſence of it the heart and brain doe ſuffer with it.

Of the Spleen.

Splen a suppleo dic. quia vacuum locum ex contraria parte Fecoris supplet.

HAving left the Ventricle in its place for the seeing of the *Vena portæ*, wee must mind the anatomy of the Spleen or Milt, and first you shall see it placed in the left *Hypochondrion*, cleaving to the Ventricle with its little concave part, and with its Gibbous part touching the ribs, towards the back and sides; it is covered with the *Peritoneon*.

But you may lift up the Corps as if it sate, that you may the better see the situation of it, which is under the *Diafragma*, immediately in the *Hypochondrion*, especially in a living body; but in a dead body, lying along, it seemeth to bee under the ribs, because its heavinesse doth easily drive the *Diafragma* to the upper parts, for the Lungs are empty, and loose, easily yeelding; you may also break up some of the false ribs that you may the better see the situation of the Spleen; you may

may likewiſe doe ſo in the Anatomy of the Liver for the aforeſaid cauſe; this manner likewiſe would bee ſomewhat convenient in ſhewing the ſituation of the Stomach, which alſo in a dead body lying along ſeemeth (through the emptineſſe of the Lungs) to bee under the bones of the breſt with ſome of its upper part, more than it is naturally in a living body.

Its ſhape is ſquare, ſomewhat like a half Moon, of a looſe ſubſtance; it hath colligancy with the Heart by great arteries (which you muſt mark) making thin the groſs bloud, which being made thin nouriſheth the Spleen; it is faſtned to the Liver by a branch of the *Porta*, to the braine by nerves, to the *Meſentereon* and *Omentum* by veins, and to *Siphac* by the pannicle covering it, to the ſtomach by many veins, ſome wherof doe nouriſh the left part of the Ventricle, and one doth milk out melancholy unto the mouth thereof; its quantity is known; its com-

complexion is ordained hot and moyſt, and is appointed oppoſite for that which is contained in it; in number it is one member; it is helpful to the whole body by purging the maſs of bloud from the dreggs, and for that cauſe it provoketh laughter; ſometimes it maketh bloud, it ſtirreth up appetite, it helpeth the digeſtion of the Stomack; it ſuffereth every kind of Diſeaſe, and there is ſometimes in it a ſpecial impediment of its courſe and ſtrong motion; and it is held that that part being taken away by a wound Creatures doe ſometimes live, and there are ſome that think, that through the greatneſſe of it laughter hath been quite hindred, and that it hath ſometimes changed place with the Liver (but very ſtrangely.)

Of the Liver.

HAving ſeen the aforeſaid parts, you muſt raiſe up the Corps, as it is afore made plain, that the Liver may ſhew its ſituation,

ἧπαρ *ab* ἔπειν ἔχω *id eſt operari ſanguinem.*

ation, which is immediately under the *Diafragma* in the right *Hypochondrion*; it is great in a man, because hee is a hot and moyst Creature; it is of a Moon-like shape; its concave part is toward the Ventricle, but its gibbous part is touching the ribs about the *Diafragma*, but higher, and toward the sides, and the back. Its substance is the flesh of it, and the net woven of the Veines dispersed in it, and its flesh is coagulated bloud; it hath five Loabes, sometimes four, and three, and sometime two.

In the hollow part of it is one Veine called *Porta*, which entreth into it with five branches, which toward its gibbous part are dispersed throughout the whole body even to the least members; that the *Chylus* divided in them to the least members might the better be transformed into bloud.

Also in the hollow part is a little *Cistis* or bladder cleansing the bloud from Choler, before it pass unto the gibbous part; also in the

hollow

hollow part the *Vena Umbelicalis* entreth into the *Vena Portæ* to nouriſh the young one in the Mothers wombe.

In the gibbous part is one Vein called *Chilis*, diſperſed alſo with five branches through the whole body of it unto the leaſt members; the leaſt branches of this *Chilis* are joyned or united with the branches of *Porta*, and they ſuck from them bloud purified from Choler and Melancholy, but mixed with waterineſs, which requireth a farther decoction in the gibbous part.

The Liver hath vent in its gibbous part of the *Septum tranſverſum*, and of the *Vena Chilis* aſcending by it to the heart, by which it is faſtned unto it; it hath alſo ſmall Arteries in the hollow part of it by which it is vented. Theſe Arteries come from *Aorta* which is neer there, and are difficult to bee ſeen; it is faſtned to the *Metaphrænum* by its pannicle ſuſpending, and to the *Abdomen* by the *Vena Vmbelicalis*; to the braine by a Nerve; but by the

means of a pannicle risen from the *Peritoneon* of which it is circumvolved; it hath also colligancy with every member that hath a vein; its complexion is hot and moyst; in number it is one; its parts are proper flesh, the *Vena Porta*, *Vena Chilis*, and Arteries, a Nerve with a pannicle, and the *Cistis* of choler; its operation is the making of Bloud; its proper passion is the Dropsie; yet it suffereth every kind of disease.

Of the Vena Portæ.

Porta quia per totum corpus portat sanguinem.

WIthout the substance of the Liver is *Vena Portæ*, so called of a witty man according to its nature (*Galen* being witnesse,) and from him hath the name remained untill now; which *Hippocrates*, and all the company of *Asclepias* have commended, because its branches doe carry the food before laboured in the belly unto that place of the digestion for the whole Creature, which we call the Liver.

This vein without the Liver hath

hath eight parts, two are ſmall, ſix greater; one of the leſſer hath two branches, one nouriſheth the *Duodenum*, and the other the *Meſenterion*, cloſe to the *Duodenum*.

The other leſſer vein nouriſheth the Ventricle about the *Portanarium*.

The firſt of the ſix greater nouriſheth the outermoſt broad part of the Ventricle.

The ſecond with ſome branches goeth towards the Spleen, from which firſt branch goeth to nouriſh the *Meſenterion*; forthwith one other great branch goeth to the Spleen, which in the way is divided into more branches, of which one great one doth nouriſh the left lower part of the Ventricle.

This ſame branch goeth on entring into the Spleen, and it ſendeth from it two branches, one of which aſcendeth, the other deſcendeth; of the aſcending there are three parts, one part nouriſheth the Spleen, another nouriſheth

the upper part of the Ventricle, the other part passeth to the mouth of the Ventricle, milking into it Melancholy for the stirring up of the appetite, which for the most part goeth forth with the excrements thorough the Intestines.

The aforesaid descending Vein is divided into two parts, one branch nourisheth the Spleen, the other goeth to the *Omentum* in the left side, and nourisheth that.

The third branch of the six aforesaid, goeth on the left side for the succouring of the Intestine *Rectum*.

Also the fourth branch of the six greater is spread into capillary branches, whereof some go to nourish the right side of the Ventricle, and some to nourish the right side of the *Omentum*.

The fifth goeth to the *Mesenterion* in that place where it is fastned to the *Colon*.

But the sixth goeth to the *Mesenterion* in that part where it is fastned with its branches to the

Jejunum

Jejunum and *Ileon*, which are called the Meseraick veins, and this is very large.

The substance of these veins is such as ot others; their quantity, and their principal number and situation, and shape and Colligancy are manifest; their complexion is cold and dry, but by reason of that which is contained, it is hot and moist; their help is to bring the afore-laboured meat to the Liver; it also with its branches beginneth the second digestion, it also carrieth nutriment to the Ventricle, to the Spleen, and *Omentum*, and it nourisheth the Intestines; it suffereth passions of all sorts, and especially opilations, and also the opening of his Meseraicks, and sometime scissures, and it suffereth with the Liver in all the diseases of it.

Of the Cistis containing Choler, which is called *Fel* the *Gall.*

THe *Cistis* of Choler called the Gall, is a purse or sack in the hol- *Fel quod folliculus gestans bilem.*

hollow part of the Liver, cleaving to a loab in the middle; it is compounded of a pannicular substance which is thin, solid, and without blood; having onely one Tunicle covered with the Pannicle which covereth the Liver; in it there are fibers of all sorts; in the inside it hath long and oblique fibers, on the outside broad.

Its substance is thin, because it digesteth not any thing, and it is hard, that it may resist the sharpness of the Choler; it hath one Pore entring immediately into its purse (which is called *communis*) being greater than others which (according to the opinions of some) is divided into three parts:

One goeth to the Liver, continued with the *Vena Portæ*, from which it draweth Choler by narrow passages, in that Pore there are onely long fibers.

One other Pore goeth towards the Intestines, which is double at a certain distance, whereof one part goeth to the *Duodenum* towards the

the *Jejunum*, that it may cleanse the Intestines from flegm and excrements by the sharpness of the Choler sent thorow it; and that Pore entreth in the *Duodenum* * Diagonally between two Tunicles of it, lest that Choler, and those things which are contained in the Intestine should go back, and stop it.

* A Diagone is a line in Geometry drawn from one corner to another.

Another (according to some) goeth to the *Pyloron* of the Ventricle to comfort the digestion with its Choler; which if it bee much, maketh a man miserable by the continual vomiting of Choler (but some do deny this Pore;) by the common neck is caused its attraction and expulsion.

Its quantity and shape appear; in number, it is one member; and it is fastned to the heart by a small Artery which it hath, and to the Brain by a small nerve; its native complexion is cold and dry.

Its helps are to purge the blood from Choler, and to make hot

the

the digestion of the Liver, and to keep it from putrefaction; it doth also comfort the Ventricle, and cleanseth it from flegm, and helpeth the expulsive vertue of the Intestines; sometimes a man is without a gall, but this man is of a feeble health, and of a shorter life.

It suffereth passions of all sorts; its proper passion is opilation, by which is caused *Morbus regius*, or* *Ictericia*, and if there is opilation in the common Pore, and the body bee not purged of Choler, then are caused cholerical diseases of divers sorts, yet the excrements may bee coloured.

* Yellow Jaundice.

But if there bee an opilation in the neck, reaching to the Intestines, and unto the *Portanarium*, then the excrements are discoloured; and also the Choler is not purged from the *Cistis*, but doth flow back to the Liver, and doth cause many cholerical diseases.

And if there bee opilation in the neck towards the Liver, the excrements may bee coloured for some

ſome time; and it will alſo cauſe cholerical diſeaſes of divers ſorts; but the opilation continuing, the excrements will bee diſcoloured. Wee have ſpoke of other things in the Comments upon *Mundinus*.

Of the great Vein Chilis, *and* Aorta, *deſcending, and emulgent.*

THe aforeſaid parts being ſeen, you may put away the *Meſenterion*, the Spleen, and the Liver, of whoſe gibbous part, reſerve that, from which the great chanel of *Vena Chilis* doth immediately go forth, that you may ſee the beginning of it; but leaving the Ventricle in its place unpuffed up that ſome other parts of it may alſo bee ſeen.

In the firſt place you ſhall ſee a great vein go forth of the gibbous part of the Liver, which is called *Parigiba*, and *Chilis*, and *Concava*, and *Mater venarum*; from which the blood is diſpenſed

χιλὶς a χιλόω, *paſco, quia partes ſanguine ut mater venarum paſcit.*

Ἀορτὴ *quod vas ſignific. ab ἀείρω, tollo, quia ut vas ſanguinem vitalem per totum tollit.*

to

to all the parts of a living creature, by means of its branches, which are the receptacles of it; this vein is ſubtile, full of pores, and gentle, not double-coated, as the *Arteria Aorta*, leſt it ſhould too long time contain the blood which is groſs, but that it ſhould quickly nouriſh the members; it is alſo ſuch, becauſe it is without motion; but an Artery carrieth ſubtile blood, which of ſome is called the vital ſpirit; this doth continually ſyſtolize and diaſtolize: therefore it is hard, groſs, and compact, leſt it ſhould bee broken, and it is ſuch, that it may a long time contain the ſubtile blood contained in it, which by reaſon of its motion is diſpoſed to ſolution. The upper part of this Vein aſcendeth to the heart and further, perforating the *Diafragma*, which is called *Chilis aſcendens*; of which it ſhall bee ſpoken in its place.

This ſame Vein directly deſcendeth, cleaving to the back, and is called *Chilis deſcendens*, which the great Artery deſcending, doth ac-

accompany, called *Aorta*, which obſerve with diligence, together with the Vein, but the Vein is above the Artery, and they are both envolved in the *Peritoneon*.

In the deſcent of both of them, their branches are firſt divided, which go to the ſwadling-bands or pannicles of the Kidneis; but when they are in the direct of the Reins, the Vein, and likewiſe the Artery, ſend from them one notable branch on the right ſide, another on the left, which are continued in the Reins. Theſe branches are called Emulgents; for the moſt part, the right branch is higher than the left, becauſe it muſt be neer to the Liver, that it may quickly cleanſe it from the Waterineſs contained in the *Chilis*; And the left is lower, that its Kidney might give place to the Spleen, which is lower than the Liver. Thoſe Orifices are not direct, that by the firſt might be drawn from members at hand, by the ſecond from members afar off,

off, and leſt their attraction ſhould bee hindring to one another.

In like manner, from that Vein, and from the great Artery under the Kidneis, are many other Veins and Arteries ſeparated, which nouriſh the *Rectum*, the Bladder, the Matrix, and the parts neer unto them. In like manner, in the direct of every Spondile, one branch from each of them enter into it, and is diſperſed in the muſcles neer unto them; alſo of the aforeſaid branches, between every Spondile do enter very ſmall branches, which do feed the *Nuca*, and the Pannicles, Ligaments, and Spondiles, which envolve and faſten the ſame *Nuca*, as you ſhall ſee in the diſſection of them; of the aforeſaid branches, ſome alſo go to the muſcles, and to the membrane of the *Abdomen*.

This Vein, and likewiſe the Artery about *Os ſacrum*, beneath the Spondiles of the Reins, is forked into two equal parts to the form of a greek letter, which is cal-

called *Lambda* λ. Some call those two-forked Arteries Sempiternal, in which do enter two Umbelical Arteries, one whereof is on the right side, the other on the left, which descend in them to the sides of the Bladder.

Those two-forked Veins and Arteries, one on the right side, the other on the left, descending toward the Hippes, (according to some) are in each side divided into ten parts, whereof one nourisheth the lower part of the Back, being dispersed through the Loins toward the Kidneis within, and without.

And one other part being divided into capillary branches, nourisheth the *Peritoneon*.

And one nourisheth the profound muscles of the Hippe.

And one nourisheth the muscles of the *Anus*, and from it spring the Hœmoroidal Veins.

And one nourisheth the neck and mouth of the Matrix, from which also two branches go to the Bladder, one to the bottom, the

o-

other to the neck of it; and that which goeth to the neck in women, is ſmall, but in men great, becauſe of the yard.

And one other of the ten goeth to the parts of the *Pecten*.

And one other extendeth to the long muſcles of the *Abdomen*; whoſe branches aſcending, are continued with the veins of the Breaſt, wch deſcend toward them; and they united together, extend to the *Mamillas*, and from that branch in a woman, there do likewiſe go notable parts to the Matrix, from whence two Veins, not accompanied with Arteries, aſcend by the *Abdomen* unto the *Mamillas*, by which they are faſtned to the Matrix; and therefore in women with childe, and in the time of præternatural retention of the *Menſtrues*, for the moſt part the *Mamillas* ſwell.

or Teats.

And one other of the ten doth alſo go to the Matrix in a woman, but in a man it goeth to the yard, and to the cod.

But another goeth to the Univer-

verſal muſcles of the Hipp.

And another part, which is the tenth, doth alſo extend to the Hipp, and that is notable, and deſcendeth by the inſide of the Hipp; and when it is neer to the Knee under the Ham, it is divided into three branches, whereof one is made oblique toward the outſide of the Shank, and reacheth unto the Little foot; and this branch is called *Sciatica*, becauſe being inciſed, it helpeth in the pains of it; and the beginning of that branch *Mundinus* knew not. One other of the three aforeſaid deſcendeth unto the Foot by the inſide, and this is called *Saphena*; but the third branch holdeth the middle between the aforeſaid branches; all which do nouriſh the Shank, and the Foot; but of them, ſpeech ſhall bee made in the Anatomy of the Great foot.

But obſerve, that there are more Veins than Arteries; Witneſs *Galen* in his ſixteenth Book of the Utility of the parts, in the thirteenth and fourteenth Chapters;

and witneſſe the ſenſe; and it is reaſon, becauſe there are many cold members naturally, not wanting eventation, for which alſo a little ſpirit doth ſuffice; therefore they have not many Arteries; and in the hands, and in the feet, and in the brain, and in the ſuperficial part of the neck, and in the *Cutis* of the whole body there are ſome Veins without Arteries; but there is no Artery without a Vein joyned to it, ſome whereof that are chiefly notable, are faſtned together by a Pannicle riſen from the Artery; and they are united together, that the Veins might bee made firm, and fortified by the aforeſaid Pannicle, and that the Artery might give life to the Vein, and that the Vein might give bloud to the Artery in neceſſities, whereof is made vital ſpirit, and the Artery it ſelf is nouriſhed: but the ſmall Arteries are not faſtned with the Veins by the aforeſaid Pannicle, although they are companions to one another, but they are companions that they may give life to, and nouriſh

nouriſh the members; witneſſe *Galen*, where it is quoted above.

And the Veins and Arteries doe goe from the nearer places for the nouriſhing of their members, except the Veins and Arteries of the Teſticles, and *Mamillaes*, which goe unto them from afarre off, that the bloud might make long delay in them, by which it is the better digeſted, and is more eaſily turned into good Sperm, and into Milk; and there are many Arteries and Veins not perceiveable by the ſence, as thoſe which goe to the bones and to the skin, and thoſe which extend unto the extream parts of the members.

The ſituation of theſe Veins and Arteries, and alſo the ſubſtance and the quantity, and the ſhape doe appear; the number of the branches of them is unperceiveable; their colligancy appeareth by that which hath been and is to bee ſaid; their helps are to nouriſh and give life to the whole body; they endure paſſions of all ſorts.

But to them doe happen Diſ-

eaſes compounded of the chief of Opilations, which are worſer than the opilations of the noſtrils, and Inteſtines, and like places; both becauſe their opilation forbiddeth the members to bee nouriſhed, not ſuffering the bloud to flow unto them; as alſo becauſe they cauſe the bloud to flow back again unto the Liver, which cauſeth in it opilation, or putrifieth, or induceth ſome other ill Diſeaſes; alſo their oppilation is ill, becauſe it is often unknown, and becauſe Medicines cannot bee well applied unto them, as well within the body as without: their ſolutions may bee of an inward cauſe, and of an outward, of which there are three kinds, one is commonly called *Diabroſis*, which is a *corroſion* of the vein, of *Dia*, which is *de*, of, or compoſition, and *Broſis*, or *Roſis*, which is *Comeſtio*, an eating; another kind is called *Rexis*, which is interpreted *inciſio*, inciſion; the third is called *Anaſtomoſis*, which is the ſame that the opening and dilatation

tion of the Veins is every where; *Diabrosis* corrodeth the veins, *Rexis* cutteth them, *Anastomosis* causeth them to open.

διάβρωσις. ῥῆξις. Ἀνάστομωσις.

But to the Emulgent Veins (among other Diseases) may happen a weakness of the attraction of the wonted watery bloud, as also in the Reins, whereupon they doe either not attract, or else weakly; and thereby happeneth either a difficulty, or a total ablation of the Urine; yea there being in the Bladder no Urine; in which case rude Physicians doe erre, attempting to draw Urine from the Bladder, with a Siringe or other handy operation, and that is a singular hazard, for the most part bringing death, which I have often seen, and amongst the rest, I was with many honoured Physicians, in the cure of the magnificent and illustrious Lord, Lord *Galataeus*, of the noble Family of the *Palavicinians*, which was suffocated by the waterinesse of Urine gathered together in the Veins throughout, and this waterinesse

induced to him a Squinancy, for which wee applied *Ventoſes* without ſcarification for diverſion ſake, and the *Ventoſes* were filled with pure water through the pores of the skin; but theſe things by chance I have written for the profit and honour of young men.

Of the Reins.

Renes ἀπο τοῦ ῥεῖν a fluendo: quod per eos Sperma & urina fluunt.

WIth the aforeſaid Emulgent branches are continued two fleſhy bodies ſolid, covered with the *Peritoneon*, called *Renes*, or *Renones*; they are two and not one, as the *Ciſtis* of Choler, and the Spleen, becauſe the waterineſſe is more than the dregs and ſcum of the bloud, for which is required one great place of purging, or two ſmall ones; and it was not one great Kidney, leſt it ſhould cruſh together and preſſe the Inteſtines, and leſt they ſhould make the Back unequal; and they were two, that if the operation of one ſhould bee hurt, that of the other might remain firm; and they were

were ſolid, that they might help much in a little room; and leſt the Bloud ſhould goe forth with the Urine by ſome of its Pores; and that they might not draw any thing by ſucking it, but that which is thin; and that they might reſiſt the ſharpneſſe of the Urine; they were alſo ſolid, becauſe a thick body is ſtronger for attraction.

Their quantity appeareth; their ſhape may bee ſeen, which is like the grain of the Kidney bean; they have colligancy with the Brain by Nerves, by means of the Pannicles involving them; with the Liver by the aforeſaid Veins; with the Heart by great Arteries. *Galen* hath noted, that the great Arteries in the Kidnies, are not only for the cauſe of nutrition, and giving life, ſeeing the Kidnies are little members, for which a little Artery did ſuffice, but in them there are great Arteries, becauſe they doe alſo cleanſe the Heart from waterineſſe and Choler; and hee ſaith moreover, many times

Phaſeolus, Plin l. 18. ca. 12.

Aorta draweth from the Stomach, and from the Inteſtines bloud not pure, yea *Chylus* which the Emulgent arteries doe purge out to the Kidnies.

I my ſelf alſo in the year 1521. in our exerciſe at *Bononia*, ſaw in one publiquely Anatomiſed, one of the Emulgent arteries that made one Pore in the right ſide without the Kidney, which in a notable diſtance beneath the Kidney did enter into the *Uritidian* pore riſen from the aforeſaid Kidney, and both of them by one chanel did reach unto the Bladder; nevertheleſſe this Emulgent artery did alſo enter into the Kidney in his wonted place; and in that individual the Kidneys were continued, as if it were one Kidney; and it had two Veins, and two Emulgent arteries, and two *Uritidian* pores with one only Pannicle involving, which did take up the wonted places of the Kidneys, and alſo the middle part of the Back, which is in the place between the Spleen and the Liver, a little below them. There-

Therefore let alone the left Kidney in its place, for the seeing of the Spermatical vessels, and divide the right in its concave part through the middle, according to the length of it, unto its center, considering the place of its Vein and great Artery, which doe enter into the substance of the Kidney in the hollow part of it, from which the Kidney doth draw spirit and nutriment, and the watery superfluities of the whole body mixt with Choler; all these mixt matters pass thorow the whole substance of the Kidney although it bee solid, because they are subtile; for bloud could not pass alone to the least parts of the Kidneys, because they are solid, except it were mixt with water and Choler; all which mixed are resembled to the washing of flesh, being drawn by the Kidneys thorow the Emulgents, from the Liver, and from the Heart, by means of the vein *Chilis*, and the artery *Aorta*.

This bloud mingled with much wate-

waterineſs is alone retained of the Kidneys for their nutriment ; and the water together with the choler ſeparated from the bloud paſſeth to a certain notable hollowneſs, being in the center of the Kidney, as it were into a ditch; the which the river or chanel called the *Uritidian* pore bringeth to the Bladder; this Pore called of the Greeks * *Ureтra*, is a very long, panniculer, ſolid, hollow body, having its beginning from the body of the Bladder (becauſe as it is ſaid it reſembleth it) and ending at the Kidney, which conſider with warineſſe, and keep together with the Kidney for the anatomy of the Bladder.

οὐρηθρα.

And in the Kidney there is not a net, neither any other panniculer ſtrainer, as ſome ſuppoſe, but the Kidneys are made hollow Organes, attracting by ſome Orifices, but ſending forth by others a thin wateriſh ſuperfluity.

Therefore *Galen* ſaid in his fourth Book, *De Utilit. cap.* 12. Finally, many Drunkards drinking

ing whole *Amphoras*, and piſſing the proportion of the multitude of drink, are not troubled about the ſeparation, but the bloud which cometh to the *Vena cava*, is readily and by ſtealth all purged forth by the Reins not touching the Vein; the afore-named Ditch hath about it a ſolid Pannicle, perforated with more than ten great holes, through which Nature milketh forth the Urine into the aforeſaid hollowneſſe, by means of a certain ſmall ſubſtance of the Kidney, like to the Nipples of the Teates of women.

The Colligancy of the Reins appeareth by that which hath been ſaid; they are alſo faſtned to the Brain by a little Nerve, by means of a pannicle covering them.

Their helps are to purge the whole body from ſuperfluous Water and Choler, but eſpecially the Liver and the Heart; nevertheleſs in the reſt of the Veins there alſo remaineth much Waterineſſe mixt with the Bloud, which

is

is called *Vehiculum nutrimenti*, the Waggon of the nutriment, which appeareth in Bloud flebotomised, or otherwaies drawn from the body.

They suffer every kind of Disease, all which almost are of a hard curation, as is the *Diabetes*, or as it were the continual dropping down of the Urine; they also suffer a weakneſſe of the attractive quality, by means of which the Urine goeth not to the Bladder, and by that means a living Creature is sometimes choaked, or dyeth some other way; also of such a weakneſſe is caused the *Ascitis*: they also suffer Stones, Gravel, and Hairs, but the hairs are bred or condensed in the *uriti-dian* pores; the stones of it are red, small, oftentimes long, being bred in the aforesaid trench; when the Kidneys are weakned, not able to retain the bloud, the Urine goeth forth bloudy; it also goeth forth so when the Liver is weak, not separating the Watrineſſe from the Bloud, by

that

that ſeparation and qu antit which it ought.

Of the Seminary Veſſels called Spermatica.

THoſe things being diſpatched in both Sexes, firſt you ſhall note in the great Vein *Chilis*, and the Artery *Aorta*, ſometimes above the Kidneys, ſometimes below, one little Vein, and one Artery, both which are united at ſome diſtance touching one another, deſcending to the Teſticles of the right ſide.

σπέρμα *idem eſt quod ſemen a* σπείρω, *ſemino.*

You ſhall alſo note two like Veſſels in the like manner deſcending, and united in the left ſide, one from the Emulgent vein of the left Kidney, and another from the Artery *Aorta*; all thoſe little Veins and Arteries ſo deſcending are called *Vaſa Spermatica præparantia*, that is, the Seminary preparing veſſels; theſe veſſels are covered about with a Pannicle riſen from the *Peritoneon*, called of *Celſus Ægitroides*; the Vein

lyeth

above, but the Artery lyeth beneath.

Thoſe veſſels are broader and harder in a Man than in a Woman, excepting the time of impregnation and menſtrues, as it appeareth to the ſenſe, by the much bloud then retained in them; but at other times they are harder and broader in a man, and alſo they are always longer, becauſe they are to carry their matter contained to a longer diſtance; and they are ſuch, becauſe the Maſculine Seed is more, and is groſſer than the Feminine; by which length alſo of the veſſels of a man his Seed is the more digeſted; and the Seed of the right ſide engendreth Boyes, becauſe its matter is more digeſted, and cleanſed from waterineſſe, but of the left ſide Girls, becauſe it is cold and watery, coming from the aforeſaid Emulgents filled with watery bloud.

Theſe veſſels in both Sexes agree in the place from whence, but diſagree to whence; their termination in a woman is within the

he body, as it ſhall be ſaid in the Anatomy of the Matrix, which is placed after the Anatomy of the Yard, and of the *Anus*, for better orders ſake.

But theſe veſſels in a man deſcend on both ſides unto the *Os Pectinis*, in the end of the *Ilia*, above the Loyns, and therefore they are alſo called *Lumbaria*, which veſſels in their deſcent above the *Os Pectinis* doe enter on both ſides into one panniculer covering, riſen partly from the extream parts of the *Sifac*, which is commonly called *Didymus*, and *Cremaſteres*, and they paſſe in the Cod near unto the Teſticles, as it may bee ſeen in one only ſide, leaving the other ſide untouched, for the ſeeing of the Anatomy of the *Didymus*; but take heed leſt you ſpoyl the *Scrotum* in any part, but draw that veſſel only which you intend to ſee together with his *Didymus*, and Teſticle, to the upper parts toward the *Pecten*.

Theſe veſſels deſcending neer unto the Teſticls are very hard, and

A Diſeaſe in certain Veins ſwelled with wind and melancholy bloud like Worms.

and are revolved like to *Varices*, whereupon they are called *Varici-formia*, which are made ſoft when they meet with the Teſticles (about which they are revolved) leſt they might hurt them with their hardneſſe, and there theſe veſſels are called *Epididymi*, and *Anendor*, and *Andros*.

From thoſe veſſels the matter of the Sperm doth immediately paſs to the Teſticles, in whoſe ſubſtance it procureth whiteneſſe, and the generative vertue; and from the Teſticles it is again caſt out to the aforeſaid ſoft veſſels named *Epididymi*, from which it paſſeth to other inferiour veſſels continued with them, which are called *Deferentia*, whoſe ſubſtance is white, and harder than the reſt; theſe different veſſels in a man aſcend from the Teſticles unto the *Pecten*, being contiguous with the aforeſaid preparing veſſels deſcending; which Deferents ſo aſcended in the upper part of the *Os Pectinis*, are turned back again within the belly on both ſides;

which

which keep warily together with the Testicles, until you have seen the Anatomy of the *Didymies*, and also of the Testicles.

These vessels reflected within the body descend between *Rectum* and the Bladder, and there they dilate themselves into more caves full of Sperm, therefore there these Vessels are called *Conservantia & Deferentia*, keeping together, and carrying the Sperm; and of *Galen* guided by *Eracleus*, they are called *Parastrata*, *Adeniformia*, because Kernelly flesh doth compass them.

On the right side, and on the left, these Vessels do pierce through the neck of the Bladder, and within the Yard about the *Anus*, they cast forth the Sperm, which afterward is driven forth through the Chanel of the Yard.

Διδυμὸς *sig: geminus quia gemini sunt*

Of the Didymies.

THese Vessels together with the Testicles, are involved in each side with one Pannicle, from the

bottom of the Cod unto the lowest part of the *Ilia*; the greater part whereof hath its beginning from the *Peritoneon*, descending into the *Scrotum*, in the end of the *Abdomen*, which is commonly called *Didymus*, and *Suspensorium Testiculi*. Of the Greeks they are called *Cremasteres*; the substance of which consider, which are of three, (and perhaps according to some) of four revolutions of Pannicles.

The first is outmost, risen from the Pannicles of the Spondiles; another is risen from *Sifac*, or *Peritoneon*, contained within the *Abdomen*, neer unto the Thigh, which of *Celsus* is called *Darion*.

Of these two, by reason of their strong Colligancy, is made as it were one onely Pellicle.

Another is of the Pannicle, immediately involving the aforesaid vessels, risen from the *Peritoneon*, about the back; which is called *Ægitroides*.

Another is of the Chords of the muscles

muſcles of the Teſticles, which is ſmall; conſider alſo their quantity and Colligancy, their complexion and number; they have the Shape of a *Ciſtis*, in the top narrow, in the bottom broad, as much as is the thickneſs of the Teſticles.

Its uſes are to hang up the Teſticles, and to keep faſt the aforeſaid Veſſels.

Of the Scrotum, *or Cod.*

Scrotum ſeu Scertum ex σκύτος *pellis, ὀχέος Galeno ἀπὸ τῦ περιεχέιν αὐτὰ, quod Teſticulos tegat veletq;*

Of thoſe Pannicles, and of the skin, is compounded *Oſcheon*, or *Scrotum*, that is, the purſe of the Teſticles, in which there are ſome Nerves giving ſenſe unto it, and ſome Arteries and Veins nouriſhing it; and the *Scrotum* is one member common to the two *Didymies*, and it is a *Sinus* or vault, to the *Didymies*, Teſticles, and to the Seminary Veſſels.

This member is divided by the middle of a light Membrane, which of ſome is called *Sutura*, & *Taurum*, & *Chorda*; which al-

so doth somewhat appear in the outmost skin in the middle of the *Scrotum*, according to the length of the Body; the Quantity, Shape, Situation, Number, and Colligancy of this Member, are apparent; its complexion is cold and dry; its helps appear.

This member with the *Didymies*, endureth every kinde of disease; their proper passion is a dilatation of them, by which means are caused many Burstnesses, called *Herniæ*, to wit, one of the *Zirbus*, called *Omentalis*; another *Intestinalis*. In the *Scrotum* also is caused the *Hernie*, or *Hymea*, waterish, windy, humeral, and fleshy; and also the *Varicous*; which is made by a repletion of the Seminary Vessels, caused of gross blood, or of much and watery.

Testiculi dicti quod testes sunt Virilitatis.

Of the Testicles.

WIthin the aforesaid *suspensories* on both sides are two glandulous white members, like

like to the fleſh of the Teats, which are called *Teſticuli*, whoſe Shape is like an Egge, and therefore they are alſo called *Ovæ*; their ſubſtance is without blood and all ſenſe, yet it feeleth by its Pannicles; each of them hath two muſcles cleaving to its Pannicles, that they might preſerve them, and lift them up, leſt they ſhould be relaxed.

Their Quantity, their Number, and Situation, are apparent: their Native complexion is temperate in things active, moiſt in paſſive, but in fluent it is hot, by which means (Witneſs *Ariſtotle*) they draw to themſelves from the whole body matter of the Sperm, as it were *Ventoſes*; and they are placed of Phyſicians among the principal Members; they have Colligancy with the other principal Members, by Veins, by Arteries, and by Pannicles; their helps are to preſerve the Species: they endure paſſions of all ſorts.

Vesica quasi vas aqua

Of the Vesica, or Bladder.

THese things being dispatched, take away the Kidneys with the *Uritidian* pores, risen from the Bladder, entring *Diagonally* within its Tunicle, nearer to the neck than to the bottom, lest the Urine might flow back unto them; through those Pores doth sometimes pass a Little stone to the Bladder bred in the Kidnies, causing in them an extension, with a vehement pain, because they are Sinewy as the Bladder.

First, cut the body of the Bladder about the bottome of it, which is compounded of one onely Tunicle, in the outward part of which do go two Nerves for its sense; first noting its Situation, which is in the Lower part of the Belly, in the hollowness of the Little trough, in which is also the *Intestine Rectum* toward the Back, and the Matrix in a woman in the middle of them.

You shall also note its Colligancy, and Quantity, and Shape, and Num-

Number, whose substance is Sinewy of the Nerves of the Ligament, not to bee consolidated, if it receive solution, in the Neck it is fleshy, and therefore there is consolidated; its Neck is united to the Yard throughout, even unto the extream part of the *Glans*, from whence goeth forth the Urine.

Its complexion is cold and dry, and it is circumvolved with one Pannicle risen from the *Peritoneon*; its uses are to retain the Urine a long time, lest a man should continually rise to send it forth: But it doth as it were, continually flow from the Kidneys to it. Certain glandules of flesh do help its retention, envolving and compressing the beginning of its Neck, on the outside; causing in the Neck some turnings, by reason of which the Bladder is not wholly cleansed from the water, and one onely muscle of the Bladder, envolving the mouth of it, doth help its Voluntary retention, and likewise Expulsion.

The Bladder may endure paſſions of all ſorts, which are ſometimes incureable, as is a very great ſtone; and Excoriation in a Cholerick body, and in an old man.

Virga quaſi Vim gerens.

Of Virga, *or the Yard.*

AFter the aforeſaid Members, cometh the Yard, which is of a Ligamental ſubſtance, it is alſo Sinewy and hollow like a Spunge, yet with ſome muſcles; the Yard, and likewiſe the Tongue, hath more and greater Veins and Arteries than any other Member like to it in bigneſs; through the aforeſaid Poroſities the Yard above being guided by the imaginative vertue, is oftentimes magnified and erected of the Spirit, for in it is a natural virtue, by which when a living creature is moved to Copulation, it is puffed up, and enlarged; and there is cauſed naturally a motion in the Heart and in Arteries, but in theſe it is cauſed alwaies for neceſſity; but in this ſometimes when

it

it is neceſſary. Its beginning and Situation is of a part of the *Pecten*, in the middle, known to all.

Its Shape is very long and round, having in it a Chanel, by which the Urine and Sperm go forth. The upper part of it is called *Glans*, and the head of the Yard, and there it is compact, hard, and of a dull ſenſe, leſt it ſhould bee hurt in copulations; a certain ſoft Skin doth compaſs about that *Glans*, which is called *Preputium*, being obedient to turning back in every Friction.

Præputium a præputando eo quod a Judais præputaretur.

This *Præputium* in the lower part, in the middle onely, according to the length, is faſtned to the greater part of the *Glans*, by a certain Pellicular member, called of the Vulgar, *El filello*.

Its Number, and alſo Quantity, are apparent; its Native complexion through influence is hot and moiſt; it hath Colligancy with the *Os pectinis*, with the Kernelly *Paraſtata*, with the Bladder, by means of the Chanel without,

by

by which the Urine floweth forth; with the Brain, by means of the Nerves, coming to the muſcles and skin of it; with the Heart and Liver, by means of the aforeſaid Arteries and Veins deſcending.

The Yard hath in it three Orifices, one wide, the which is common both to the Sperm and Urine; and two ſmall, by which the Sperm coming from the aforeſaid Seminary veſſels, do enter into that common Orifice. Thoſe two Orifices or Veſſels, do enter into this Chanel, in the place called *Perineon*, which is a place between the Yard and the *Anus*. That Chanel from thoſe Orifices to the Bladder, is according to the truth called the Neck of the Bladder; from hence unto the extream part of the *Glans*, it is called the common Hole and Chanel of the Yard, and of ſome it is called *Uretra*.

The Yard alſo hath four Muſcles, two towards its lower part, on both ſides one, near unto the Cha-

chanel of the Urine; which are long-ways extended, and do dilate the Yard, and elevate it; that the Sperm may with easiness peirce thorow it.

There are of it two other Muscles beginning from the root of it towards *Os Pectinis*, coming transverse about the *Glans* in its upper part; which when they are extended the Yard is lifted up, and when they cease from extension it is kept down; that if the extension happen to one, and not to the other, the Yard will decline to the part of the extended muscle.

The profit of the Yard is made principally for conservation of the Species; for by its means the Sperm is sent into the field of Nature, that is into the Matrix; which if it be of a moderate quantity (as likewise the Tongue) it is praised, and is profitable; for the shortness of it doth not bring the Sperm to the due place; and its too much length is the cause of the resolving of the spirits in the Sperm.

The

The Yard also by its Colligancy doth empty the Bladder from Urine, whereof it is a sign, because Lice applied to its extream Orifice provoke it by biting.

The helps of the *Præputium*, and the aforesaid Pellicle fastning it to the *Glans*, are to yeeld some delight in Copulation, and to defend the *Glans* from outward hurts.

That *Præputium* the *Jews* take away in Circumcisions, working contrary to the intent of Nature; the Yard suffereth passions of all sorts, its proper passion is a *Priapism.*

For the well seeing of this Anatomy, the things spoken of being first observed, and the situation of the Intestine *Rectum* being noted, separate with a *Scalprum*, *Falx*, or Saw, or other Engine, the *Os Pectinis* from its lateral part, and together with the Bone separate a notable part of the Buttocks, to wit, that in which are the muscles of the *Anus*, and take away the *Rectum*, the Bladder, and

the

the Yard, with the Seminary Veſſels, and the aforeſaid *Uritidian* Pores, and put the aforeſaid members (being firſt waſhed, and clean from the dung and bloudineſs contained in them) upon ſome table, that you may the better ſee the aforeſaid members, putting away with diligence the *Os Pectinis* only from the aforeſaid members.

And firſt, you ſhall note the place of the afore-named *Uritidian* Pores entring into the Bladder, by putting into them a *Probe*, or *Radius*, or ſome ſuch thing, and you ſhall perceive it peirce Diagonally through the ſubſtance of the body of the Bladder, into the hollowneſs of it, as hath been ſaid before.

Theſe things being ſeen, you ſhall alſo ſee the aforeſaid Seminary veſſels to enter between the *Rectum* and the Bladder, and with ſome inſtrument of Inciſion ſeparate warily the *Rectum* from the Bladder, becauſe in that place theſe members are very firmly

faſtned,

faſtned, and you ſhall ſee the *Paraſtata* afore-named full of caves, and large, and inciſing them you ſhall find the Sperm there contained for two or more Copulations, and theſe Veſſels are terminated in the chanel of the Yard.

And about that place you ſhall ſee notable glandulous fleſh on the ſides of the neck of the Bladder, which doth ſomewhat digeſt and whiten the Sperm there contained, or at leaſt keepeth it that it be not dried up, conſerving alſo in it the genitive ſpirit.

Thoſe fleſhes doe alſo keep the neck of the Bladder leſt it ſhould be dried, and alſo the Yard, which by reaſon of its length hanging without is apt to bee dried, and ſhut up; and for this cauſe Women have not that fleſh; alſo thoſe fleſhes with their ſomewhat fatneſs reſiſt the ſharpneſs of the Urine.

Theſe things being noted, you may ſlit the Yard long-ways, and you ſhall ſee the aforeſaid chanel

with

with the Orifices, through which the Sperm entreth, which are two, one on the right side, another on the left, not much distant from the hollowness of the Bladder; you shall also see the body of the Yard hollow, or pory, to the likeness of a Spunge, not very hollow, but somewhat compact.

Of the Rectum.

THe aforesaid things being noted, you must bee mindful of the place of the Intestine *Rectum* left before, for the Anatomy of the *Anus*, which you shall observe to bee in the hollowness of the little Trough, and is terminated within the Buttocks, in the place called *Anus*, from whence by the order of Nature those excrements of the first digestion goe forth; the higher part of it reacheth to the left side where it is fastned to the Intestine *Colon*.

You shall also consider its quantity,

tity, which is apparent; and its Shape, ſituation, and number you have ſeen afore; it hath Colligancy with the Heart, with the Liver, and the Brain, with the Bladder in a man, and with the Matrix in a woman.

Conſider alſo its Complexion, which is cold, therefore it is between the Buttocks, leſt it ſhould be offended by cold.

After this divide it according to the length, and having very well waſhed it, you ſhall obſerve its inverſion, which is aſcending from the outermoſt part to the inſide, the ſpace of four fingers or thereabouts; for oftentimes you ſhall ſee the end of its inverſion, and ſometimes you may not ſee it; this inverſion cleanſeth it from the Excrements, becauſe in the avoyding the excrements the *Rectum* doth ſomewhat deſcend; and this is beſt ſeen in Horſes avoyding their excrements.

σφιγκτὴρ α σφίγγω *ſtringo, eſt muſculus.*

The lower extremity of it is called *Anus*, and *Podex*, and *Sphincter*; and it hath many other names

names recited by mee in my *Commentaries* upon the Anatomy of *Mundinus*.

Its ſubſtance is fleſhy and Panicular, which is made more fleſhy with its Muſcles, there is in it ſome fatneſſe toward the outſide, in it there are many broad and long Fibers, few Oblique, the long are without, and within, helping the expulſion by drawing downward.

In it there are Four Muſcles, one is in its extream Orifice, being mixed with the *Cutis*, and diſperſed throughout with it; which conſtringeth the *Anus* on every ſide, by which means it cometh to paſſe that the dung may bee wholly cleanſed from it, there is another Muſcle more within, being raiſed toward a mans head, which Muſcle hath two heads, and is here continued with the root of the Yard; the benefit of it is ſtrictly to bind the extream part of the *Anus*: after them there is one pair of Muſcles reaching over-thwart above the

others, whose help is to raise the *Rectum* upward, which being mollified, there is caused the falling down of the *Rectum* without, between the Buttocks, for a certain distance.

In the extreamity of this Intestine there appear many Veins, in some notable, in some hidden which are called *Hemorroidales*, flowing by fits, which consider.

Those Veins have their beginnings from the branches of the Vein *Chilis* descending, nourishing the muscles of the *Anus*; many do use the Flux of them instead of Purgation, neither are they made very weak by it.

The helps of the *Anus* are to bring forth the Dung in due time, its muscles help the *Parastata* in the sending forth of Sperm in Copulation, whereof it is a sign, because some are at once copulating and avoiding excrements. They also help the Bladder in the sending forth the Urine.

The *Anus* suffereth passions of all

all ſorts; all which are hard to bee cured; and amongſt the reſt the extreamity of the *Rectum* falleth down; and in like manner the Matrix, which wee bring back by Stiptick means; there are alſo bred *condylomata* or certain little ſwellings; The *ficus*, and alſo *fungi*, likewiſe *Mariſca*, and *Ragadas* or *Ragadia*, which are wont to proceed of Inflammation; yet ſometimes a laſcivious wantonneſs of Luxury and Burning Luſt doth cauſe theſe Diſeaſes, in both Sexes; ſeeking by-ways, nature being neglected, not without the injury of it, and the Divine Majeſty.

Of the Matrix, not prægnant.

Matrix a matre quæ a materia dic. quod ibi materia ſpeciem conſervan inſeritur.

THe Members contained in the Lower belly of a man, being ſeen, I paſs unto the Anatomiſing of a woman, in which the Anatomy of the Matrix is to bee ſeen, and of their Teſticles, with the Seminary veſſels, and their Bladder.

The Matrix which is also called *Vulva*, hath two parts, to wit, a Receptacle, or *Sinus*, or hollowness, and *Cervix*, or *Collum*, a Neck, and it is a Member created of Nature for increase; the substance of its Receptacle is Sinnowy, mixed of the Chords of a Ligament and confused flesh, therfore it is a little sensible, and it is compounded of one onely Tunicle, circumvolved with the *Peritoneon*, and it is Sinnowy, that it might bee extended in Copulations, and that it might bee gathered together to a little quantity in the Birth; also all its hollowness is moved to the Center in the receiving of the Sperm, and embraceth and toucheth it with its sides.

But the substance of its Neck is of Lacertous flesh, as it were, Cartilagineous, having wrinckle upon wrinckle, which do give delight by Friction in Copulations; this part is sensible enough.

Its hollowness is called *Uterus*,

and

and *Venter*, and *Receptaculum fatus*.

Its fastning which is the Orifice of the Neck, is called, *Pudendum Muliebre*, and *Vulva*, and *Natura*, and *Os Genitale*.

In this Neck is the Yard placed in Copulations.

Between the Neck and the Receptacle within, is a certain pellicular substance, fleshy, sensible enough, perforated in the middle, that may be dilated and constringed, called *Os Matricis*, the Mouth of the Matrix, having the form of a Mullets head, otherwise of *Cephalus*, or of the Tench fish, or of a new bred Puppy; which in Copulations, and Births, and *Menstrues*, is opened by the order of nature, but at other times, especially when it is pregnant, it is so shut, that a small needle cannot enter into it, unless with violence.

The Shape of its Neck is very long, round, hollow, it is as much unviolated as is the Yard of him that doth copulate therewith, but

in a Virgin it is leſs.

This hath about the middle of it, the Virginal pannicle, like a Net woven together of ſmall Ligaments, and very many Veins, which one violated, is without, becauſe it is broke in the firſt copulation with a man; this Pannicle is called *Eugion*, and *Cento*, and *Imen*.

To the extream part of the Neck, on the ſides are added Skins, which are called *Præputia*.

Within the Neck, a little towards *Os Pectinis*, doth enter a ſhort Neck of the Bladder, whoſe Orifice is ſhut up of certain ſmall, fleſhy, and pannicular Additaments, of which, and of the aforeſaid *Præputia*, by reaſon of the Ayr, there is cauſed ſome noiſe in making water.

The Shape of the Receptacle is Quadrangular, with ſome roundneſs, hollow below as the Bladder.

In the Receptacle towards the Neck, there is on both ſides one Ligamental additament faſtned to

the

the Back toward the *Anchæ*, having the Shape of a Snails horn, therefore these are called, the Horns of the Matrix.

About these Horns on both sides, is one Testicle, harder, and less than in a man, not perfectly round, but prest together like an Almond; in them are ingendred Sperm, not gross, as in a man, nor hot, but watery, thin, and cold.

Those Testicles have not one Pannicle, in which they may be both contained, as is the *Scrotum* in a man, but each hath a proper Pannicle, risen from the *Peritoneon*, fastning them about the Horns; and each of them hath one small muscle, of which it is moved.

In those Testicles are implanted the aforesaid Seminary vessels, which being called *Præparantia*, descend from the *Chilis*, and from *Aorta*, and from the Emulgents; from thence do reach other Vessels, named *Deportantia*, continually spreading themselves unto the Receptacle, and they bring Sperm within the hollowness of the Matrix.

The Orifices of these Vessels are called *Fossulæ*, and *Cotilidones*; through them flow the *Menstrues*, from them doth the young one draw Nutriment by the Umbelical Veins and Arteries fastned to the aforesaid *Fossulæ*.

In a woman there are not the Vessels *Parastata*, nor the Vessel *Epididymum*, because in a woman the soft Vessels are not offensive to the Testicles, as they are in a man through their hardness.

The whole Matrix with its Testicles and Seminary vessels, is like to the Members of Generation in men: but the Members of men are compleat, expelled forth by reason of their heat; but of women they are diminished, retained within for their want of heat.

And the Matrix is as it were the converted Instrument, for the Neck of the Matrix is as the Yard, and its Receptacle with the Testicles and Vessels is even as the Cod.

For in the Cod being turned in,

in, there is a hollowneſs within it; and without it, being likewiſe turned in, there do lie the Teſticles and Seminary veſſels, as in the Receptacle of the Matrix, but the Teſticles and Veſſels of men are greater.

The Situation of the Fiſſure of the Matrix is between the *Anus* and *Os Pectinis*, and the place which is between both Orifices, is called *Perinion*.

The Neck aſcendeth above from the Fiſſure through the Belly, unto the Receptacle, whoſe place is between the *Rectum* and the Bladder; all theſe are placed long-waies in the hollowneſs of the Little trough.

The Quantity of the Receptacle in Damoſels, is ſmall, and leſs than their Bladder; neither is its hollowneſs filled, unleſs with the filling of the increaſe of the body, whereof it is: but in full grown (unleſs it be great with young) it is not much greater than may bee comprehended in a hand; but it increaſeth by reaſon of the

Men-

Menſtrues, having walls, as it were, fleſhy, thick, and groſs, but in one pregnant, it is very much ſtretched, and thin, appearing more Sinnowy, and then it aſcendeth towards the Navil, more and leſs, according to the quantity of the young one.

It hath onely one concavity or Cell, which nevertheleſs ſomewhat toward the bottom of it, is divided into two parts, as if they were two Matrixes, both ending at one Neck.

In the right ſide of it, for the moſt part are faſtned the Male, in the left the Female.

It hath Colligancy with the Brain by Nerves, with the Heart by Arteries, with the Liver and Teats by Veins, with the *Inteſtine Rectum* by Pannicles, with the Bladder by the Neck of it, which is ſhort, not penetrating without, as in a man; with the *Anchæ* by the horns (but of the horns above) The Receptacle is every way looſe, and therefore falleth to the ſides, and ſometimes its

its Receptacle goeth altogether forth out of the body, through the Neck of it.

The Number of it is apparent, and perhaps hee doth not erre that ſaith there are two Matrixes, becauſe there are two Concavities as two hollow hands, touching one another, covered with the ſelf-ſame Pannicle terminated at one Chanel.

And that you may ſomewhat ſatisfie your ſelf, of its Figure, Place, and Situation, you may ſee the under-written Figures immediately following; to the ſeeing of which let not him come which is not ingenuous and expert in Lines, and Shadow, or in Picture, which doth much help Phyſicians, and many other Artificers; the Native complexion of the Matrix actuated by the Influence, is hot and moiſt; its helps are to purge the body of its natural bloody Superfluity; but principally to conſerve the *Species.*

It may ſuffer every kinde of diſ-

diſeaſe; it often falleth down, and it may all bee drawn forth out of the body, the health remaining. One Matrix being corrupted, I ſaw drawn wholly forth by my Father in the Land of *Carpus*, which was cured, and lived long.

I alſo at *Bononia*, drew forth one other wholly, which was cancrenated in the year one thouſand five hundred and ſeven, in the Moneth of *May*, which lived in health.

One other being corrupted, my Kinſ-man (by my brother) *Danianus*, drew wholly forth in my preſence, in the Aſſembly of many Doctors and Scholars, *anno Domini* one thouſand five hundred and twenty, the fifth of *October*, that laſt by name. *Gentilis* was the Wife of *Chriſtopher Briantus* of *Mediolanum*, inhabitant at *Bononia*, in a Country called *Lo Inferno*, which at that hour one thouſand five hundred twenty two, the tenth of *November*, was found, and exerciſing houſhold affairs.

Millane.

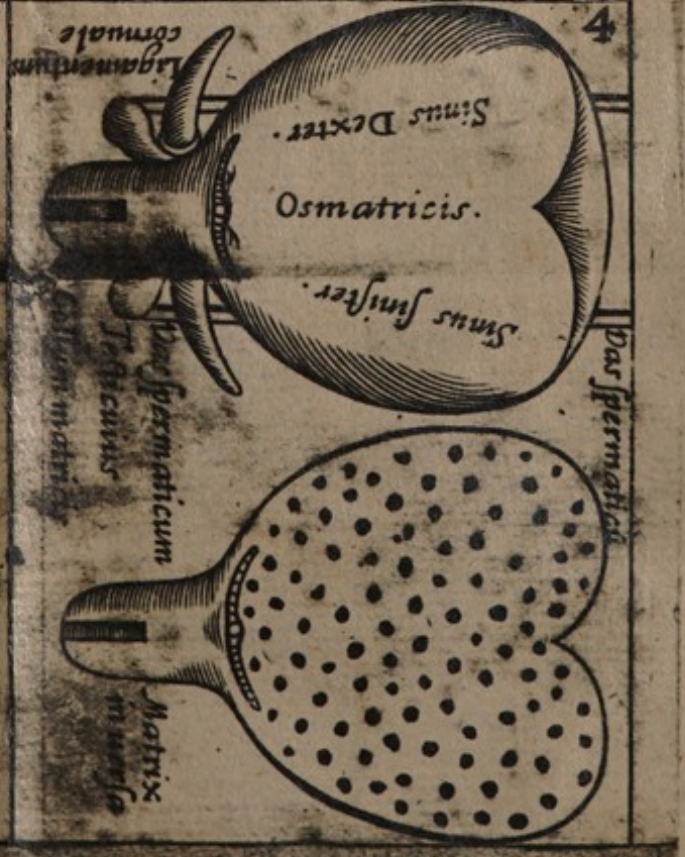
If

1 Place these 4 figures of the Matrix betweene 108 and 109 pages

2

3

4



If you seek greater things, look in my Commentaries upon the Anatomy of *Mundinus*, and there you shall have of the pregnant Matrix, and many other things. And these things are sufficient for the Anatomy of the Lower Belly.

The first Figure of the Matrix.

YOu have in this Figure the Matrix with its Horns at the sides, under which in their natural place are the Testicles fastned to the Seminary vessels, which vessels, as you see, are terminated at the body of the Matrix: and they have their Original above, about the Region of the Reins, from the Emulgent, and from the Vein *Chilis*, as it is said above; and this Matrix is figured great, as if it were pregnant. In the former part of which is the Bladder, with its *Uritidian* pores, and the Neck of the Bladder is terminated in the Neck of the Matrix, fastned a little above, which is called *Vulva*;

va; and the Testicles in this Figure are in their due place; but these things are better seen in the Anatomising of one woman great with Childe, and also one not with Childe.

The second Figure of the Matrix.

YOu have in this Figure the whole Matrix with the Horns, and the Testicles above the Horns, and you see how the Seminary vessels go to the Testicles, and from the Testicles to the Matrix, but the Testicles are not in their natural place, because their natural place is below the Horns, but they are set above the Horns in this Figure, that the Seminary vessels may the better be seen to enter into them, and you shall see in this Figure, how the Mouth of the Matrix is above the Neck, which Mouth is that Hole which you see above the Neck of the Matrix.

The third Figure of the Matrix.

YOu have in the Belly of this Figure the Matrix opened, in which you see some black pricks, shewing the Heads of the Veins, which are called *Cotilidones*. You have besides the Matrix turned in without the Belly, and it is that Figure over which you see the Finger, a token of the present Figure, and in the bottome of the Matrix is a certain depression, as you see, which is that that distinguisheth the right side from the left; neither may there another division bee found in the Matrix; and them black pricks are the *Cotilidones*; and you see how the Neck of the Matrix is without *Cotilidones*; and you see how the Neck is like to a mans Yard.

The fourth Figure of the Matrix.

BEcause things ten times repeated, are wont to please, you have

have here two other figures of the Matrix, whereof one is turned in, in which you see how in the Receptacle throughout are many black prints, betokening so many *Cotilidones*, which nevertheless are not in the Neck; in the other you see the natural Matrix with the Testicles and Spermatical vessels, and the horny Ligaments, with which it is fastned to the *Anchæ*; you see also the Neck and Mouth, through which the *Menstrues* and the young one go forth, and the seed of man entreth in.

Of the Anatomy of the Middle Belly.

THe aforesaid things being seen, dissect the Middle belly, in which are the Vital members, with which also for the better orders sake, you shall see some members of the former part of the Neck, and some parts of the Face within and without, before the upper Belly be Anatomized.

The Parts first to bee seen, are

are the Members of the Breaſt; which is called, *Caſſus*, *Clibanum*, and of ſome *Thorax*; for in that are parts containing, and contained.

And of the parts containing (as in the Lower belly) ſome are common, ſome proper, and ſome more proper.

The parts common, are all the parts compaſſing the emptineſs of the Breaſt; whereof ſome are before, ſome on the ſides, and ſome behinde.

But in that Belly (neither is it ſo in the Belly of the Natural members) are placed the upper parts, neither are the lower determined by them, as in the Upper belly: becauſe the parts before, on the ſides, and behind, in the Belly of the Natural members are united, and do make the lower part of that, and in like manner make the upper part of this Belly; for this is terminated in its upper part; but that in its lower part, as in a point, and this is compaſſed about of the aforeſaid

parts above, and that below. But the *Septum transversum* or *Diafragma* doth mediate between them, and maketh the uppermost part of the lower Belly, and the lowermost of the upper; but because the *Septum transversum* is common to both Bellies, therefore it is not properly and determinately put for any containing part of the aforesaid Bellies; but Authours do place it among the parts contained; nevertheless it is a part contained and containing; and it is called contained, in as much as it is within the hollowness of the body, and it is containing, because on the upper part it containeth the Natural members, and on the lower the Vital.

I say therefore, that the common part of the Middle belly before, and on the sides, is called *Pectus*, but the hinder part is called *Summum dorsi*, the top of the Back; and they that place the Neck with the Back, do name this middle part of the Belly, the middle of the Back.

But

But the parts proper, ſome alſo are before, ſome on the ſides, and ſome behinde; thoſe which are before, are commonly appointed three, *to wit*, an upper, a lower, and a middle.

The upper is a place, where immediately under the Neck are joyned together two Bones, both of them reaching ſide-waies toward the Shoulders, called the two Lateral *Furculae*; and this part is named the upper *Furcula*, taking its name from its figure and place, taking up a little room, eſpecially in the length of the Breaſt; and this place of ſome is called *Jugulum*, and *Clavis*.

Immediately under that is the middle part, properly called *Pectus*, ſo called, *Quia pexa eſt inter Eminentes Mamillarum partes*, becauſe it is hairy between the Eminent parts of the Teats; and this part is downward from the firſt aforeſaid part, almoſt as far as the *Septum tranſverſum* in length, but in breadth as much as is the breadth of the bones of the

Iſido: vi. Rider: de pectore.

Breast, the Ribs excepted.

But the lower part is the place where the aforesaid bones of the Breast are terminatad about the Region of the *Septum transversum*: and because those bones reach on the Sides, making likewise a Fork, therefore this place is called the lower *Furcula*, in the middle of which is *Cartilago scutalis*, called *Pomum granatum*, because it is like to a part of the *Balaustium*, that is, of the flower of the Pomgranate.

But the lateral parts are termed the Ribs, and the Sides, and the Region of the Teats.

But the posteriour parts, some are in the middle, and some on the Sides; those in the middle are called *Interscapilium*, & *Metaphrenon*, & *Noton*; those on the sides are called *Scapulæ*, *Spatulæ*, & *Scapilium*; but some do call the lateral parts with those in the middle, *Metaphrenon*, & *Noton*.

But the parts more proper, some are also before, some on the sides, and some behinde.

Those

Thoſe which are before, are firſt the Skin, the Fat, ſome muſcles, the bones and Cartilages, and the Pannicle *Pleura.*

But the lateral parts are the Skin, the Fat, the ſubſtance of the Teats, many Muſcles, Ribs, and alſo the Pannicle *Pleura.*

Laſt of all are the parts behinde, to wit, the Skin; ſome fat; fleſh muſculous, and ſome ſimple, not muſculous, filling up certain Vacuities of the bones, twelve Spondiles of the Ribs, or of the Breaſt, and the Pannicle *Pleura.*

The parts contained, are the muſcle *Diafragma*, called *Septum tranſverſum:* which according to ſome is to be numbred among the parts contained of the Breaſt, in as much as its principal operation is to ſerve the Heart by reaſon of its motion, by which it moveth the Lungs: there is after that the Pannicle *Mediaſtinus*, *Capſula Cordis*, the Heart, with his Artery *Aorta*, and the Lungs with their Veſſels, the *Vena Chi-*

lis ascending, the Nerves descendent, and the ascendent which are called *Reversivi*, the Glandule called *Timum*, & *Morum*, the *Gula*, that is the passage for the meat from the mouth to the Ventricle, with the Pannicles covering the aforesaid Members.

The substance of this Belly is pellicular, fat, bony, cartilagineous, musculous, and panniculer.

The Bones of it are not united, as in the Head, but divided, that the Breast might bee obedient to the motion of breathing; and therefore for its motion there are muscles in it; *Galen* said 7 *de Utilit*: If the Breast were made of muscles onely, they would fall upon the Heart and Lungs; that therefore there might bee some space between, and that in like manner the whole Organ might be moved, the muscles are placed to the Bones by course.

This Belly called *Pectus* is great in quantity, because it serves many and great members, yet it hath

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a greater hollowneſs behinde than before; the beginning whereof toward the hinder part is from the firſt Spondiles under the Neck unto the *Septum tranſverſum*, as much as twelve Ribs contain: but before, it taketh up onely the part contained between the upper *Furcula*, and the lower incluſively.

In a man the Breaſt is broad, not carinated, as in the greater part of Beaſts, yet it is broader in a man than in a woman; but for the bearing of the young, the lower Belly is greater in a woman than in a man; and for this reaſon the Region of the Reins, of the bone *Sacrum*, and the *Ancharum* in a woman is very large.

The Shape, and Number, and Situation of the Breaſt appears, but the inward concavity of it is like to the hollowneſs of half an Egge, cut obliquely through the breadth, the part whereof is ſharper toward the Neck; it is alſo like to the nail of an Oxes hoof (as is the figure of the Lungs.)

It hath Colligancy with the whole body; its complexion is according to its parts; its native complexion actuated through influence is hot; the helps of it are principally to keep the Heart, and the Lungs: it ſuffers paſſions of all ſorts.

Mamilla diminut. ex Mamma quæ ex voce infantium dicitur, ut etiam Papilla ex voce Pappas.

*The *Author* taketh *Mamilla* from *Mamillana*, a kinde of Figs like Pugs.

Of Mamillæ, *or the Teats.*

IN the former part of the Breaſt toward the ſides are two round Members, taking their name *Mamilla* from their * Figure, called of the Ancients, *Rumæ*. In the middle of each of them there is one little Knob, which is called *Papilla*, through which the Infant feeds, about which there is a Circle, which is red or roſet, and ſometimes black, called in Greek, *Fos*. The ſubſtance of theſe is of Veins, Arteries, and Nerves, between which there is a hollowneſs, which glandulous fleſh doth fill up, being white, without ſenſe, and by reaſon of its whiteneſs, when blood ſtaieth in them, it is made

made white, and is turned into Milk; and the Teats turn blood to whiteneſs, and make Milk, as the Liver turneth *Chilus* into redneſs, and maketh it blood; for every one of them turneth the humour in them contained to its own likeneſs in nature and colour: of this blood, being made white, the one part nouriſheth the Teats, and the other is Milk, and this is a profitable ſuperfluity.

Unto the Teats do come their Veins and Arteries, deſcending from the Region of the Armpits about the Ribs; and alſo from the Region of the *Pecten* do come Veins through the *Abdomen*, which you have kept above, thoſe Veins and Arteries do beſt appear in a body very lean, but in a fat they are hidden; but they are very well ſeen in a *Fœtus* of three or four moneths.

The number of the Teats, and the quantity appear, yet they are greater in a woman than in a man for the ingendring of Milk; their Situation is in the Breaſt, becauſe

it

it is broad, not carinated, in which they may fitly bee placed; and alſo becauſe the ſuperfluity of the Members above paſſeth not into Hairs, neither into the Teeth, nor into the Horns, as in brute Beaſts.

They have Colligancy with the Brain by Nerves, with the Heart by Arteries, with the Liver and Matrix by Veins; but they receive the greateſt part of the blood from the Matrix, of which the Milk is made, therefore thoſe that give ſuck, have not their *Menſtrues*, unleſs ſeldome, and few; and in thoſe that have not their *Menſtrues* in due time, their Teats ſwell; alſo the Teats do ſwell, and are pained a little before the time of the *Menſtrues*, becauſe the Matrix, and the Veins therewith united, are full.

The helps of them in a man are for comelineſs, and for the defence of the Members of the Breaſt; and they reverberate heat to the Heart, and ſometime there

there is Milk made in a man by reaſon of the abundance of Nutriment, eſpecially in one that hath great and ſtrong Teats; in a woman they have alſo the aforeſaid helps, but they are principally for the ingendring of Milk, that the new-born Childe might bee nouriſhed therewith, untill it can ſwallow ſolid meat; and Milk is a proportioned nutriment for the new-born Childe, becauſe it is made of blood, by which it was firſt nouriſhed in the womb; they ſuffer diſeaſes of all ſorts.

Of the Muſcles of the Breaſt.

THe aforeſaid things being ſeen and noted, you may excoriate the Skin of the whole Breaſt, leaving the muſcles in their place, and inciſe the Teats, that you may ſee their ſubſtance, eſpecially their fleſh, in which are Veins and Arteries diſperſed throughout, and ye ſhall obſerve the

Pectus quaſi pactus quod ex coſtis quæ veluti firmamentum pectoris ſunt, compactum aut pactinatum ſit. Gaſp. Bauhinus.

*Papilla. the * nipples to have very many small holes, from which the Milk goeth out; at which holes (according to some) the extremities of the aforesaid Veins are terminated, through which the Milk goeth forth; and according to others the Milk goeth forth from the Spongiosities of the flesh of the Teat terminated at the holes of the Nipple, and not immediately from the Veins; both of them are probable.

These being seen, you shall note in the Breast many muscles, which move the Breast voluntarily; although the Breast may also bee moved naturally, to wit, according to the motion of the Heart and Lungs, as wee have said in our Commentaries; whereof some are without, some between the Ribs, and some within the Breast.

Of those without; there are two under the upper *Furculaes*, continual with the first Rib, which do reach to the head of the *Spatula*, and with them are united

ced one other pair, whereof every odd is doubling the first pair, and making it into two parts, the upper part whereof is continued to the Neck, and moveth that, but the lower moveth the Breast, and this pair is continued with one pair, which is continual with the fifth and sixth Rib.

After that is another pair in the hollowness of the *Spatula*, continued with one pair coming from the Spondiles, even unto the *Spatula*, and all they are, as it were, one pair, which are continued with the hinder Ribs.

After that is another pair, risen from the sixth Spondile of the Neck, and from the first and second upper Spondile of the Breast, continued with the same Ribs; and all those muscles do dilate the Breast.

After that there is one other pair extended under the roots of the upper Ribs, which descending, is united with its extremities to one pair, which is about the lower *Furcula*, continued with the

the long muſcles of the *Abdomen*; above which pair are two pair which cover it, and all they binde the Breaſt.

But the muſcles within the Ribs are dilating and conſtringing, differing among themſelves in their work; and thoſe which are between the Ribs, between Rib and Rib, are four, to wit, two muſcles toward the outſide, and two toward the inſide, which ye ſhall know, ſeparating them lightly, by the going of their Fibers; the two firſt uppermoſt have their Fibers tranſverſe, and do dilate the Breaſt; but the ſecond, which are below, have their Fibers broad, and are conſtringing.

But the muſcles within the Breaſt, is onely one, to wit, the *Diafragma*, or *Septum tranſverſum*, which when it reſteth, draweth the Breaſt together, (but by accident) and when it is moved, it doth dilate it, yet the motion of the *Diafragma* is compounded of voluntary and natural.

The

The number of which in all is one hundred and five muſcles, the aforeſaid muſcles of the Back and Neck excepted, to wit, the two firſt under the upper *Furculaes*, and two other continued with the fifth and ſixth Rib; after that two muſcles coming from the hollowneſs of the *Spatula*, continued with the hinder Ribs; after that two from the ſixth Spondile of the Neck, and from the firſt, and from the ſecond of the Breaſt continued with the ſame Ribs; and thoſe are eight in all, all dilating; there are alſo ſo many conſtreining (the *Diafragma* excepted) which alſo dilateth.

And of them which conſtrein, firſt, there are two under the upper Ribs, and two about the lower *Furcula*, above which are four o thers covering them, all which together with the *Diafragma*, are 17, afterward there are between the twenty four Ribs twenty two ſpaces, and for every ſpace are four muſcles, which are in all between the Ribs eighty eight, and together

ther with the aforesaid seventeen, they make the number one hundred and five muscles.

But that all they may well be seen, the *Spatulaes* must bee also excoriated, and the Back; and first you shall see the outward muscles, secondly the muscles between the Ribs; the *Diafragma* shall be seen below in its place; but these things are spoken more largely of mee in my Commentaries upon *Mundinus*.

Mark, O Reader, that the motions of the Breast are four, to wit, violent expiration, and unviolent, and inspiration unviolent, and also violent, to which the aforesaid muscles are obedient.

In the unviolent motion of inspiration, do serve the muscles between the Ribs, dilating the Breast; also the motion of the Heart and Lungs do serve it, for whilst the *Diafragma* is moved, it draweth the Lungs, which is filled with Ayr like a Breast plate, and dilateth the Breast, the dila-

tive

tive motion of the heart helping it; also the two first muscles which are about the upper *Furculaes*, do help that motion, and that motion is mixed of voluntary and natural, the natural excelling.

But to the violent inspiration, do concur with these aforesaid, all the other muscles dilating the Breast, together with the *Diafragma*; and that motion is also compounded of natural and voluntary, the voluntary abounding whilst the Heart remaineth in strength.

But to the unviolent motion of expiration, do concur (though easily) the inward muscles of the Ribs, and all the other constringent muscles; but this motion is chiefly natural, because it is caused of the Heart, and of the Lungs. But to the violent motion of expiration, the Heart and the Lungs do help, but all the constringent muscles do principally help, and likewise the muscles of the *Abdomen*.

By that which hath been said, doth appear the affinity of the

muſcles of the Breaſt, and their figure, place, quantity, and ſubſtance; their number is ſpoken of; their complexion is hot and moiſt; their helps are ſpoken of; they ſuffer paſſions of all ſorts.

Of the Bones of the Breaſt.

THe bones of the Breaſt are not one continued, as in the Head, but they are many, touching one another, that they might be dilated; thoſe which are before, and on the ſides, are properly the bones of the Breaſt; but thoſe which are behinde, are more appropriated to the Back; the lateral bones of the Breaſt are called of the Latines,* *Coſtæ*, they are called in Greek, *Pleura*, or *Pleuron*, and *Chondron*; in number they are twenty four, in each ſide twelve, of which the ten lowermoſt (five on each ſide, in Greek called *Roas*) are ſhorter than the reſt, and not much bony, but cartilagineous, which of the Latines are called *Mendoſæ*, and *Incompletæ*, the

* *Coſta ut Cuſtos quia ab ipſis Viſcera Cuſtodiantur, vel a Coaſſo.*

the falſe Ribs; but the uppermoſt are compleat and whole, and are called *Coſtæ veræ*, or the true Ribs, which in each ſide are ſeven, with which on both ſides is continued the aforeſaid bone of the Breaſt; which bone in the middle is hard, and toward the Ribs cartilagineous, becauſe between the bone of the Breaſt and the Ribs, there is a Cartilage.

This bone is (according to ſome) compounded of ſeven bones, to which on both ſides are united the ſeven true Ribs; and according to ſome others, it is of fifteen, that is ſeven on each ſide, and one in the middle; and according to others, it is of twenty one, to wit, of ſeven in the middle, and of ſeven Cartilages on both ſides, to which the true Ribs are united.

Their figure is crooked, like an half-Moon; their ſubſtance, and quantity, and place appear; the Ribs have Colligancy with the firſt twelve Spondiles below the Neck, and with the aforeſaid bones

of the Breast, and with the Pannicles covering them; their complexion is cold and dry; their helps appear; they may suffer passions of all sorts.

You should see the Anatomy of them best, if in one undivided, you would attend them onely, not having respect to the Spirituals members.

Of the Pannicle Pleura.

Pleura nomen tenet de costis ita dictæ, sub quibus locum habet.

BEtween the Members containing, is placed a Pannicle immediately cleaving to the Ribs, and the bones of the Breast, which is called *Pleura*, whose substance is Sinnowy, hard, and subtile, from which do arise the Pannicles, immediately covering the Members in that Belly; its figure is plain, extended throughout in the circumference of the Breast, and it is also extended about the *Diafragma* throughout, toward the upper part of it, firmly cleaving to it; its quantity appears from that which hath been said; it ra-

keth

keth up the whole concavity of the Breast, excepting a certain part of it before, which is taken up of the *Mediastinus*.

Its number, and situation, Colligancy, and complexion, are apparent; its helps are to cloathe and defend the Members of the Breast, and to fasten its bones together; and to mediate between the bones and the Members contained in the Breast, lest that which is soft, should be hurt of that which is very hard; it endureth passions of all sorts; you shall not see that Pannicle perfectly, unless incising the Ribs, you open the Breast, in that manner which shall bee spoken of below.

Διαφράγμα διαφράττειν *interseпire itnq; latine dicitur Septum transversum inter spiritualia & naturalia dividens.*

Of the Septum transversum, *or* Diafragma, *the Midriff.*

THe parts containing being seen, the contained do follow; and first, is to be seen a Panniculare muscle, called *Diafragma*, Secondly, the Pannicle *Mediastinus*, Thirdly, the Pannicle called

led *Capsula*, and *Receptaculum Cordis*, the Receptacle of the Heart; after those Members shall be seen the Heart, and the residue of the parts contained in the Breast.

I say, that within the body between the upper and the middle belly is a certain substance pannicular and fleshy, fastned to the Back about the twelfth Spondile; which is fastned to the Back toward the fore-part, alwaies by the extremities of the false Ribs, untill it is terminated and bound to the end of the lower *Furcula* of the Breast; and so it divideth the natural members from the vital; and this member is called *Septum transversum*, and *Paries*, and *Phrenes*, and *Diafragma*; and *Galen* in his Book *de Voce & Anhelitu*, calleth it *Percordium*, which is a Muscle, and not a Pannicle, yet it executeth the office of a Pannicle in defending the Heart and the upper members from the stinking vapours fuming up from the members of nutrition; its

fleshy

fleshy part is at the extream parts of it; and its Chord is in the center of it, united to the Lungs, because by that Situation it serveth to move it.

To this is the Pannicle *Pleura* fastned throughout toward the upper part; and in the same manner the *Sifac* is fastned to it below; it is perforated toward the Back by the Vein *Chilis* ascending, from which there do remain in it two Veins nourishing it, one on the right, the other on the left; the Artery *Aorta* descending, doth also perforate it toward the Back; and the *Gula* or *Merum*, which is immediately fastned to the Ventricle toward the Lower Belly.

Its shape and quantity appear; its Substance, Colligancy, and Situation are spoken of; yet it is fastned to the Heart by small Arteries, and to the Brain by three pair of Nerves, whereof two come from the *Nuca*, and one from the Brain, and those appear sometimes notable.

Its complexion is hot and moist; its helps are in part spoken of; yet *Galen* said, that in it is the beginning of respiration, and of all the strength of the body; and these helps hee first found out; it helpeth also in expelling from the Stomach, and from the Intestines, and from the Matrix some matters contained in them; it also provoketh laughter (according to some) by moving the minde in ticklings beside the will. It suffereth passions of all sorts; its solution is deadly.

Mediastinus eo quod hunc ventrem medio dividit.

Of the Mediastinus.

AFter the Anatomy of the *Diafragma*, cometh the Pannicle *Mediastinus*, so called, because it divideth the void places of the Breast in the middle, according to the length; it hath also other names; for the seeing of which, first, separate the bones of the Breast from the Ribs, on the right side, and on the left; in like manner (lest you should hurt the parts

con-

contained in the Breaſt) ſeparate alſo the *Diafragma* before, from the bones of the Breaſt; and you ſhall obſerve that Pannicle to divide the Breaſt from the bottome to the top, and from before backward: its ſubſtance is pannicular, its figure and quantity appear, its Situation is ſpoken of; in number they are two Pannicles, notably diſtant toward the fore-part, having in them a notable hollowneſs; but toward the Back it appeareth one onely; it hath Colligancy with the *Pleura*, from which (according to ſome) it hath its Original; it hath alſo Colligancy with the *Diafragma*, and with the Back, and with the Lungs, by means of a Pannicle riſen from the *Pleura*; it hath alſo Colligancy with the *Meri*, witneſs *Avicen*, and alſo with the bones of the Breaſt; it hath Colligancy alſo with the Brain by Nerves, with the Heart by Arteries, with the Liver by Veins; its complexion is cold and dry; its helps are to divide the

breaſt

Breast and the Lungs through the middle, that if hurt should happen to one part, it might not happen to the other; it also defendeth the upper *Furculaes*: from it there is also a conservation of the heat of the Heart; it endureth passions of all sorts.

In qua ut in capsula Cor includitur.

Of the Capsula Cordis.

THe aforesaid things being seen, you must put away the formost bones of the Breast, separating them from the former part of the Pannicle *Mediastinus*, which leave in its place, untill you have seen the Anatomy of the Lungs; take away also the tops of the Ribs on both sides, that yee may have large room for the seeing of the other parts, and in that Section you shall well consider the bones of the Breast, and also the *Pleura*; but leave the *Diafragma* whole, where you can, fastned in its place, especially to the Back, that the Nerves coming to it from above, may bee seen,

and

and that the Colligancy of the *Gula* or *Meri* with it might bee ſeen.

Thoſe things being taken away, you ſhall ſee the Lungs, in the middle whereof is one Pannicle, faſtned to the *Mediaſtinus*, which is hard and groſs, that it might the better defend the Heart from outward things; the ſhape whereof is even as the Bowel contained of it, called, the Heart, which is hollow, and like a Pouch, and therefore it is called *Capſula*, a little Coffer, in which there is the Heart it ſelf, and water in a notable quantity bedewing it, and hindring, leſt it ſhould bee dried up by its ſtrong heat; which if it be exhauſt, there is cauſed *Morbus Cardiacus*, or the paſſion of the Heart; whereby a living creature is brought to a conſumption, as it hapned to *Galens* Ape; this *Capſula* is very ſenſible; and perhaps was perfectly bred at the firſt with the Heart. Its ſubſtance, ſituation, ſhape, and helps have been ſpoken of; in number

it

it is one, its quantity appeareth, it is faſtned to the pannicular roots of the Heart, and to the *Pleura*, and *Mediaſtinus*, and *Diafragma*, by their Pellicles, to the Liver by Veins, to the Heart by Arteries, to the Brain by Nerves; its native complexion is cold and dry, but influent, hot, becauſe it is next the Heart; it ſuffereth paſſions of all ſorts.

Leave in their place the aforeſaid *Capſula*, and *Mediaſtinus*, and *Diafragma*, untill you have ſeen the Anatomy of the deſcending Nerves, which as they deſcend to the lower belly, do ſend branches to the aforeſaid Members, as it ſhall be ſpoken hereafter.

Cor a Cura quia in eo omnis ſollicitudo & ſcientiæ dulſa manet.

Of the Heart.

AFter the *Capſula*, the Heart doth occur; in the Anatomy of which, and alſo of the Lungs, and of ſome parts of the Head and Neck, I will proceed more largely, by reaſon of their artificial compoſition and operation.

For

For the dignity of the Heart is of more value than other parts, for of al the members it is the moſt principal, and is called, *Sol Microcoſmi*, the Sun of the little world, for it illuminateth the other members by its Spirit, for this hath a ſpecial heat; it doth certainly pant, and hath motion as a living creature; therefore it is reported to bee the firſt thing formed in young ones in the womb, after that the Brain and Liver, the eies (as it pleaſeth ſome) but very ſlowly; but that theſe do dye firſt, but the Heart laſt; this member onely is not putrified by hurts; neither is it free from the puniſhments of life, but being notably hurt, it preſently bringeth death, and the life remaineth in that, though the other parts be corrupt; and for this cauſe that creature liveth not, in whoſe Heart there may be found a hurt, as it is in other parts.

And creatures which have a little Heart, are bold; but they are fearful which have a great one; as by the proportion to Mice, to

the Hare, to the Asse, to the Stagg, and to all fearful creatures, or through fear hurtfull; but a great Heart endued with much Spirit, doth make them more bold than others.

It is reported, that some men have been born with a hairy Heart, and these are more bold and stronger than others; as for Example, *Aristomenes Messanius*, which slew three hundred *Lacedemonians*, and hee, when he was wounded and taken, at length escaped, getting away through a Cave of Foxes; being taken the second time, hee being adventurous, escaped; the third time being ensnared, the *Lacedemonians* cut open his Breast for the cause of seeing his man-hood, and his Heart was found hairy. All creatures also have a Heart that have a Midriff and blood; Witness *Aristotle 2 de Histor. cap.* 15. but in some it cannot bee discerned by reason of its smalness.

The Situation of the Heart

is

is in the middle of the Breast within the Lungs; in man only it declineth to the left Papp, with its lower part; lest it should meet with the bones of the Breast, which are not carinated, as in Beasts, but compressed into breadth.

It hath the shape of a *Pyramis*, but the gibbous part is not chiefly such, because it is hot, following the form of fire; but because it is a perfect mixt body, having life, it possesseth a shape competent to its work.

Its upper part wherewith it reacheth to the upper members, and is fastned to the Back, is broad; and this part is the more noble of the parts of the Heart, because the life of a living creature is conserved by the means of two Orifices of Arteries of the left side, coming from that part; but the bottom doth gather it self into a sharp figure, and goeth out almost into a swords point; and in the former part it is eminent.

Also its gibbous part is toward the

the upper parts of the Breast; and it is of such a shape, that its upper and lower building might bee good; and that there might not be a superfluity in it, apt to hinder its continual motion, and that in the end of it, it might be gathered into one point, that that which is hurt with the touching of the bones, might be the least of the parts of it, that it might take the less hurt.

Its substance is of simple flesh, every where solid, but it hath part of its point, and the left side of it of grosser flesh, that it might conserve the Spirit placed there, and that it might equal the weightiness of the blood contained in the right Ventricle with its weight, whose walls are lighter than of the left Ventricle.

In its hollow places are very many white Ligaments, (there being many Caruncles and Pellicles, or doors of the Vein *Chilis*) and they are fastned to the *Vena Arteriosa*.

Also the Heart is involved in a sub-

subtile and firm membrane, with some fatness, which do keep and strengthen the substance and heat of it, and being dried, they hinder it.

In the top of it, where it cleaveth to the Back, ar two rugged and hollow Pellicles, called *Auriculares*, which are united to the houses or Ventricles of it, to wit, to the right and left, taking and keeping the superfluent Spirit, and blood, (like a good Steward) and restoring it in necessities.

Nature hath ordained those *Auricu'æ*, that they filling up places of the Hearts greatness, might receive the Blood and Spirit sometimes over-flowing in the Heart, by which it might have had filled up the places of other members near unto it.

Also by its greatness it had been heavy, unfit for motion; and likewise if it should bee very great, it would often be empty, by reason of the want of Spirit and Blood, and consequently weak, as in fearful creatures, having a

great Heart, to wit, wanting Blood and Spirit in the proportion.

Its roots are faſtned to the top of it, which are ſolid, and hard, and as it were, cartilagineous, that its continual motion upon theſe might be nimble.

In the Heart alſo are Fibers of many ſhapes, and placed after a diverſe manner, that it might ſuſtain continual and ſtrong motions, which are natural, and not voluntary; and therefore there is not any lacert in it.

In the upper part of it about the outſide, is one Vein, proceeding from *Chilis* obliquely, branching it ſelf to the leaſt parts towards the *Mucro*, which nouriſheth it.

There alſo are two pulſant Veins, proceeding from *Aorta*, ſpreading abroad toward the outſide; one is in the ſame place wherein is the aforeſaid Vein not pulſant, which giveth life to it; another is ſpread in the right Ventricle, and bringeth the vital virtue to it; it alſo concocteth and giveth

veth life to the blood continually, entring in there, and by means of that the Liver is vented by the *Chilis* in its gibbous part, and conserveth its own vitality.

It hath a three-fold *Sinus* or hollow place, or little house, or Ventricle; the right is bigger than the left, and the left cometh unto the extreamity of its point; but the right is ended a little below that place.

Between them is a wall, gross and thick, called of *Galen*, *Diafragma*, in which are many small holes, going from the right *Sinus* into the left, being broader from the right than to the left; those holes are dilated, whilest that the Heart is abbreviated and opened, and they are shut up whilest it is lengthened and shut, by this means the blood being rarified and prepared, goeth from the right unto the left, where it is compleatly turned into the vital Spirit.

These Orifices are counted of Physicians for the middle *Sinus*.

Galen, witneſs *Avicen*, calleth that *Sinus*, a ditch, and paſſage, and not a Ventricle, that it might be the Receptacle of the nutriment wherewith the Heart is nouriſhed; which nutriment is thick and ſtrong, like to the ſubſtance of it, and it is the mine of the Spirit, begotten in it of ſubtile blood; and it prevaileth, that the more temperate blood is in the middle Ventricle.

But the right *Sinus* hath two Veins, one whereof whoſe Tunicle is ſimple, is bigger than the other Veins, coming from the Liver; it is called, *Chilis*, and *Concava*, and *Audax aſcendens*, and this is very great, becauſe it giveth blood to all the other Veins within and without the Heart, taking nothing from them, and therefore it bringeth more blood into the Heart than it can carry back; it is alſo very great, that it may contain much blood, oftentimes flowing and flowing back; and that it may bring it to the Heart in a ſhort ſpace, that it may the more commo-

modiously be concocted by it.

This blood so concocted, is divided into three parts, one part of the subtile cholerick, beingless than the rest, goeth to the nourishing of the Lungs.

The other more and subtiler than the aforesaid, reacheth through the perforations of the *Diafragma* unto the left *Sinus*, where it is made Spirit.

But the rest of it not so subtile, and which is also far more than the rest, passeth through the same *Chili* to all the parts of a living creature, and nourisheth them, oftentimes going in and out in the right *Sinus*, that it might be perfectly concocted, and might receive life.

Nevertheless *Avicen* placeth a fourth part in the middle Ventricle, which he saith is temperate, but this is unknown to my eies; perhaps because in the middle wall of the Heart there pierceth blood, nourishing it; but it turneth into the substance of the thing nourished, because there (in my

judgement) there is not blood without the Veins, unleſs in the right and left Ventricle.

The upper Orifice of this Vein is terminated at the Heart; whilſt the Heart is dilated, and draweth the blood, it is opened, and whilſt it is reſtrained, it is ſhut, expelling the blood; but it is not ſhut wholly, becauſe in part it remaineth open: therefore nature alwaies reteineth in it (as a treaſure and mine of heat) ſome portion of fervent blood. which at length changeth the Blood that cometh in into its own nature, by uniting it ſelf with it.

And this Orifice is opened and ſhut of three Sinnowy or Ligamental Pellicles, whoſe colour is white, being faſtned with their upper extremities to the walls of the aforeſaid *Sinus*, by white and ſolid Ligaments.

Thoſe Pellicles named *Oſtiola*, are wholly opened at the inſide of the *Sinus*, giving way to the blood, entring in, and are ſhut at the outſide, but not wholly, and

thoſe

thoſe Pellicles are ſolid and hard (and in like manner are the Pellicles of the arterious Vein) leſt in the great and continual motions of the Heart, there might happen to them diſruption, becauſe they are faſtned in the top of them to Ligaments, continually extending them.

But the Pellicles of the Artery *Aorta*, and of the Arterial vein, are leſs hard than they, becauſe they are not any thing extended by Ligaments, and therefore they are without fear of breaking.

Another Vein goeth to the Lungs; the name of this is *Vena non pulſans*, or *quieta*, it is alſo called *Vena Arterialis*; and it is called a Vein, becauſe it carrieth blood for the nouriſhing of the Lungs; and it is called *Arterialis*, becauſe it hath two Coats, that it might be ſtrong and compact, becauſe of the Cholerick and ſubtile blood flowing in it, and leſt it ſhould bee broke by reaſon of its continual motion; in whoſe Orifice are three Pellicles or doors,

shutting themselves wholly within the *Sinus*, and opening themselves without, giving way to the blood going out. In the Dilatation of the Heart they are altogether shut, lest the blood should flow back unto the Lungs; but in the constriction they are opened, and the Veins cleave to the walls, neither are they any where else united by Ligaments, as the most are.

The substance of these is pannicular; their shape is like to the vacuity which is within the letter C They are therefore called *Ostiola C formia*; they have also that Circular form which a mans nail hath; which Pellicles are with their Circular part fastned to the body of the Vein.

But the left *Sinus* more noble than the rest (because the middle and the right do service first to it; it also excelleth the rest by reason of the Spirit contained in it) hath in the top of it two Veins: one not much less than the aforesaid great *Chilis*, which is as the

stock

ſtock of a Tree, diſtributed through the whole body; and this is pulſant and double-coated, whoſe thickneſs (witneſs *Eroſilus*) is ſix-fold to a Vein; and this is called *Arteria Aorta*, and the great Artery; whoſe inner Coat is harder than the outer, becauſe it meeteth with percuſſion, and the ſubſtance of the Spirit, for the keeping of which it is intended.

That ſame carrieth the Vital ſpirit to the whole body of a living creature, and keepeth it in life

For by that Artery (ſaid *Galen*) all the members except the Lungs, do inſpire and expire, leſt their livelineſs ſhould bee ſuffocated; but the Veins are as the ſtore-houſes of meat, needing neither to diaſtolize nor ſyſtolize; and therefore the body of them is ſubtile, porous, and ſoft; but the Lungs do inſpire and expire by reaſon of the motion of the Heart and Breaſt.

This Artery or its branches, are ſeldom without the *Chili* accompa-

panying them, and *Aorta* ascending a little above the Heart, is divided into two parts; one part is made oblique below, and descends, which in the Breast, and in the lowest Belly, sendeth forth many *Fibraes* from it, even unto the feet, and giveth life unto the members of them; under that branch being made oblique below, they do ascend by the left Nerves of the voice, which are called *Reversini*; and this place is called, *Flexor*, and *Girgilius*, of which it shall bee spoken in another place.

Another part ascending about a part of the Lungs, and the glandule *Timum*, giveth life unto, and filleth with Spitit the upper part of the Breast, the Arms, the Neck, and Head, and the parts of them,

And alwaies those Arteries which are fastned to the Veins, by many pores or little Fibraes, are united or joyned together, and the Vein receiveth into it the Artery, and on the contrary, the Ar-

Artery the Vein; and from the Vein doth pass blood into the Artery, which is likewise made spiritual in necessity, and from the Artery into the Vein doth pass the Vital spirit, concocting the blood thereof, and conserving it in its virtue; also the Tunicles are nourished, and receive life from that which is contained in them; and this Artery is less above the Heart than below; Witness *Galen* 16 *de Utili: Cap.* 11. and it is made so because there are more parts from the Heart of a living creature below, than are above it; and this Artery is so much greater descending, than that which ascendeth by the Back, by how much the multitude of the lower parts exceedeth the upper; and in this is known not a little justice of nature: the Vein *Chilis* descending must also be bigger than the ascending for the same cause.

In the Orifice of this pulsant Vein, which is called *Auritium*, are also the three gates *C formia*, opening and shutting themselves

at

at the same time, and in the same manner, in which the Arterial vein is opened and shut.

There is in that Ventricle another Vein, not pulsant, but quiet, called *Arteria Venalis*; and it is called an Artery, because it carrieth and recarrieth the Spirit or Ayr to the Heart, and from the Heart to the Lungs; from whence it is sent without the Breast; and it is called a Vein, because it hath a single Coat.

In the Orifice of this are onely two Pellicles or doors, fastned after the same manner, and incompleat; and they are opening and shutting themselves in the dilatation and constriction of the Heart, with which they make the doors, being in the Orifice of the Vein *Chilis*; also this Arterial vein carrieth more Ayr to the Heart than it can bring out; because by the blood and Ayr brought in by it, is the vital spirit engendred, which by the Artery *Aorta*, passeth to all the parts of a living creature.

By

By the aforesaid things the Colligancy of the Heart, and the complexion and helps of it appear; its quantity may be seen; in number it is one, although it is reported, that the Heart of an Ape had two heads, but prodigiously; it is also reported, that the Partridges in *Paphlagonia* have two Hearts. Every kinde of disease may happen to it, but it endureth them not if they continue long.

Of the Lungs.

THe Heart being seen, cometh the Lungs, called in Latine * *Flabellum*, and *Ventilabrum*, and in Greek * *Pneumon*, for this is the Artificer of breathing, and the work-shop of Ayr; this is nourished by Ayr, as the body is with Meat; this filleth the hollowness of the Breast, round about the Heart with its five Coats or Lobes, whereof two are on the left side, and three more on the right; of them three one is less than the rest, cleaving to the Back,

**Flabellum dicitur a flando. Sic Ventilabrum a ventilando.*

** Græce etiam πνεύμων a πνέομαι suffler, sufflatur enim ut follis spiritum trahens & emittens.*

Back, as it were, in the middle; which hath little pipes, but almost no motion; and this is the Mat or Pallet to the *Chilis* ascending; and about that Lobe toward the top of it, there is also certain glandulous flesh, which also with the aforesaid Lobe, is a Pallet or Coverlet of the aforesaid Vein, and this flesh is of a notable bigness, and is called of Authours, *Morum*, and *Timum*; and of the Vulgar it is called, *Animella*, and *Laticinium*, and it is in usual meats of a rank taste, especially that which is found in Calves, and in milk Kids.

The substance of the Lungs is mixed of thin, light, soft, and red flesh, inclining to whiteness, like to the coagulated froth of blood, and it consists of three vessels or pipes, entangled as in a net, through all the parts thereof, in the same manner, that the branches of the Vein *Chilis* are in the Liver; and this composition may be like to a hony comb, and also to a Sponge; therefore it is capable

ble of blood and Ayr, for the Lungs is as it were a certain ſtore-houſe of Ayr to the Heart, fit to ſerve to both motions, to wit, dilatation and conſtriction.

Certainly its fleſh is rare, that there might be much blood, and Ayr continually in it. Two veſſels in it, which contain it, do ſhew the multitude of the blood, which are bigger in the Lungs than in any other member like unto it, the Heart and Liver excepted, in which the veſſels containing blood are greater, ſurely not for themſelves, but becauſe they give Spirit and blood to all the members.

This blood in the Lungs is much, becauſe the abounding plenty of it is diſſolved by reaſon of the continual motion, which a great quantity doth continually oppoſe; and it is ſubtile, that it might paſs ſuddenly to all the parts of the Lungs to nouriſh it; and it is alſo ſubtile, that it might be light, leſt by its heavineſs it ſhould hinder the motion of the Lungs.

Alſo

Alſo the long ſubmerſion of a living creature in the water without choaking, ſheweth that there is alwaies a great quantity of Ayr in it, and the ſending forth of a long and continual voice and blaſt, hindring from the receiving of new Ayr, or when one abhorreth it by reaſon of ſtink, or other cauſes, yet this Ayr in the aforeſaid drownings and ſtinks, is kept in the mouth, and in the jaws, the Tonſils helping with their Pellicles.

The help of this Ayr continually drawn, is, that by that being firſt altered, the Heart might bee cooled and contemperated in neceſſities; and alſo that the Heart might have vent, leſt it ſhould be choaked.

The utility of it alſo is, that not out of a little part thereof might be engendred Spirits neceſſary for the being and wel-being; and it is a help of the expulſion of the abounding hot and ſmoaky matter which is drawn; it is for the entring in of the Ayr that is leſs hot;

hot, being altered first in the Lungs, and then in the members through which it passeth.

This smoaky air, as it were an adusted superfluity of spirit, is driven by the pulsant Vein into the branches of the *Trachea*, in the constriction of the Heart; and afterwards goeth forth hence from a living Creature by the *Trachea*, and by the nostrils and mouth, the systolative motion of the Lungs helping it.

But the air going into the Heart hath the beginning of alteration in the Nostrils, in the mouth, in the jawes, in the *Trachea*, and in the branches of it dispersed in the Lungs; in like order which one feeding on meat and drink hath in the mouth, in the *Gula*, and in the Ventricle and Liver.

For the alteration of the Lungs in the air is compared to the alteration of the Liver in *Chilus*, for by the Liver is the Bloud made of *Chilus*, which receiveth a perfect concoction in the Heart, but the spirit is prepared by the Lungs, of

air which is made truly vital in the Heart, this going to the upper parts in the *Rete mirabili*, or in the least branches of Arteries about the Brain, is again altered; from whence entring the Ventricles of the Brain, the Animal spirit is made perfectly true, which is a bright, light, and pure spirit.

Also the flesh of the Lungs is light, lest it should hinder the motion of it; it is also soft, that it might defend the vessels thereof from breaking; and it is reddish, clear, declining to whiteness, because of the dominion of the Air over it, with which it is nourished, and also because of the coldness thereof.

A thin Pannicle doth cover this substance of the Lungs, being bred of many Membranes proceeding from the Pipes thereof, and from the Pannicles of the Brest; by means whereof it is sensible.

The Pipes of the Lungs are three, one whereof (as also the rest) growing always less, descendeth

ſcendeth to all the parts of it, even unto the Pannicle incluſively envolving it, from the *Faringa*, or *Epiglottis*, through the foremoſt part of the Neck united to the *Gula*; this is hard and alwayes open, and alſo bigger than the reſt, and it is compounded of very many Cartilages, each whereof is united one near to the other by pannicular ligaments, and this is called *Trachea*, and *Aſpera arteria*, and *Laringa*, and *Bronchium*: its Cartilages in the Lungs are entire, and alſo annilar, but in the Neck they are incompleat, and in the manner of a *C*. From their Magnitude and Figure it is judged in the Hawkings of them, whether there bee Ulcers in the extream parts of the Lungs, or in the middle, or in the neck.

Between theſe Cartilages, and in all the *Trachea* within and without, there is a Pannicle of a mean ſubſtance, perfectly circular, faſtned to the jawes and mouth, in which are Vills lengthning and ſhortning the *Trachea* in the

motions of the Lungs.

The helps of this Pannicle is also to defend those Cartilages from the going in of extraneal things; it is also a pacifier of the voyce in the going out.

This Pipe doth not carry bloud as others, but only Air; also by this alone the unnatural things contained in the breſt are purged out, having entred into it in the time of the dilatation of the Lungs by the thin Pannicle involving it, therefore is there cauſed an expulſion of Sanies, and other unnatural things to the mouth, and without; the Heart not being troubled.

This Pipe also poſſeſſeth a middle ſituation among the reſt; on the right ſide of it is the quiet Vein, but on the left ſide the Pulſant Vein, but the Pulſant Vein toward the former parts, without the Heart, doth immediately enter into the ſubſtance of the Lungs, leſt by reaſon of the motion of it, becauſe it is ſubtile, it ſhould receive ſolution; but the Vein

not

not pulſant, becauſe it is double-coated, and ſtrong, doth not immediately enter the Lungs, but firſt compaſſing about the *Trachea*, it alſo entreth the Lungs, reaching toward the hinder parts.

In this Bowel, onely the pulſant Vein hath not without cauſe changed ſubſtance with the not pulſant; for the Vein not pulſant, called Arterial, in other members is ſingle, in the Lungs double-coated; firſt, leſt it ſhould bee broken by the continual motion thereof; ſecondly, that it might alſo contain ſubtile blood, nouriſhing the fleſh of the Lungs, and alſo the *Trachea*.

But the pulſant Vein, called the venal Artery, is of a ſingle coat, nimble in motion, that it might obey dilatation and conſtriction in a ſhort ſpace; this bringeth Ayr to the Heart, and carrieth it out; in it alſo there is ſpiritual blood, nouriſhing the Lungs, (as ſome would have it) but it is rather giving it life; its branches are united or joyned together with the

branches of the *Trachea*, through which the Lungs giveth Ayr to the Heart, but the Heart not being unthankfull, giveth life and nutrition unto that.

The branches of this Vein are so narrow, that the blood cannot pierce through them to the *Trachea*, and therefore they are passable to the Ayr, but impassable to the blood; but if they be notably opened, the blood floweth from them to the *Trachea*; and perhaps (as some would have it) from the branches of the Vein not pulsant, blood also floweth into the *Trachea*, whereby is caused spitting of blood, without the solution of the Veins of the Breast; nevertheless the pulsant Vein is more apt to this.

Every one of the aforesaid vessels in their first entrance of the Lungs, is divided into five branches, always growing less throughout all the parts thereof, and multiplying their branches; two are in the left side, and three on the right, whereof one less than the

rest

reſt goeth to the little Lobe on the right ſide, cleaving more to the Back; which (as wee ſaid before) is a Coverlet to the *Chilis* aſcending.

The ſhape of the Lungs is like unto an Oxes hoof; in number ſome think that they are two members united into one, in ſuch wiſe, that it appeareth one Lung, with five Lobes, divided into two like parts, that one being hurt, the other might remain firm; in the hinder part it is longer than before, following the ſituation of the Midriff; in number it is one; the quantity of it, the ſituation, and colligancy appear; its complexion is hot from the part of its contents and place; but by accident, becauſe of the Flegms remaining in it, it is cold; its helps are to ſerve the Heart by preparation and carrying; it ſerveth alſo to the breathing, and to the voice, and in like manner to ſpeech, and its little Lobe ſerveth to the *Chilis* aſcending; it ſuffereth paſſions of all ſorts.

Collum ex κῶλον membrum i secundum eminentiam quia capitis basis aut fulcrum, alii a colle quia ascendit ab humeris collis more.

Of the Anatomy of some parts of the Neck, and of the pulsant and quiet Veins, inclusively ascending from the Liver and the Heart, even unto the Head and Hands.

THe aforesaid things being seen in the Section of parts, the *Trachea* should first occurre, and the *Epiglottis*, and also the *Gula*; nevertheless these for the present cannot well be seen, unless the Anatomy of the Neck, and some parts of the Face be set before; which being seen, wee will speak of the parts aforesaid: the Lungs therefore being dispatched, reserve some of the upper fleshy part of it, for the seeing of the Trunck of the *Trachea Arteria* (laying aside the rest) except the fifth Lobe of it, which cleaveth to the Back; keep also a certain glandule neer unto it, which is called *morum* and *timum*, that the situ-

ſituation of the *Chilis*, and the aſcendent Artery upon theſe may be ſeen, to which theſe two members are a coverlet; you ſhall alſo keep the Heart and its *Capſula*, and the Pannicle *Mediaſtinus*, and the Stomach, and alſo the Midriff, for the enquiring of other things of them.

Thoſe things being kept, for better orders ſake, I come firſt unto the ſpeech of the Neck, and I term the Neck to be an Organical member, noble, and very neceſſary to a man for the members contained in it, which witneſs *Ariſtotle*, 3 *de partibus*, *Cap.* 3. is made for the *Trachea*, ſerving to the Lungs, and for the *Gula*.

But *Galen* in his eighth book *de juvamentis*, *Cap.* 1. ſaith, that it is principally for the Lungs, becauſe creatures wanting a Neck, want Lungs, as Fiſhes: but he addeth, that the Neck is the way of thoſe members which deſcend from above downward: & of them which aſcend from below upward; thoſe which de-

descend, are the Nerves, the *Gula*, some muscles, and the *Nuca*; but the ascending, are the pulsant Veins, and the quiet: and the *Nuca* is contained of the Spondiles, that it may bee safe from outward hurts; and that hollowness which is between the parts of the Veins and Arteries, is filled by glandules remaining there; and all those are kept of their Coverings and Ligaments, after that they are all covered with the Skin; and that which is compounded of all those, is the Neck, which is placed for the Cane of the Lungs, by which is made the voice and breathing; also the Neck in some creatures is instead of a Hand, because they take their meat from the earth by the help of the Neck, by reason of the length of their feet. But of this sort the Neck serves for the Cane of the Lungs, and by means of it the Nerves do reach to the Arms, and to the Hands, and to the *Diafragma*, and to other members, the *Nuca* being their guide; and therefore for the Ori-

Original of the Nerves were the Spondiles placed between the Breaſt and the Head, of which the Neck is compounded. Theſe things *Galen* ſpeaketh, which nevertheleſs ſaith not whether the *Trachea* aſcend or deſcend; and although hee may ſay, that the *Gula* doth deſcend, yet perhaps it doth aſcend, neither can its deſcent bee proved more than its aſcent; neither of the *Trachea*; becauſe they have not a manifeſt beginning, as Veins and Arteries, and as Nerves.

Wee may therefore ſay for the preſent, that the Neck is taken for that part upon which the Head is ſuſtained and turned, which ſerveth to the upper Belly, to the middle, and alſo to the lower, by means of Nerves deſcending from the Brain, and from the *Nuca*; the ſituation of which is before from the upper *Furculaes* of the Breaſt, and behinde from the upper Spondile of the Ribs, and on the ſides from above the Shoulders, unto the bone of the Head cal-

called *Basillare*; and commonly the hinder part of it is called, *Cervix*, of which shall bee spoken somewhere else; but the former part is called *Collum*, and because this member is principally for the *Trachea*, it shall bee the nobler of these parts, for the nobility of which the Anatomy of the Neck is to bee placed with it; and because the *Trachea* is a part of the Lungs, which is of the more principal parts of the middle Belly, spoken of before; therefore the Anatomy of the Neck for the present, commeth with the Anatomy of the middle Belly.

This part named *Trachea*, is called of many, *Guttur*, and *Faringa*; although *Faringæ* (according to some) are the Veins which do swell in great voices, and those Veins are called of *Celsus*, *Granges*, and *Fragitides*, and of some, *Sfragitides*; and those Veins with the *Arabians* are called, *Guidez*, and *Apopleticæ*, and *Somni*, and of some *Pensiles*, and *Spermatici*, and *Juveniles*, and *Jugulares*, and

Or-

Organicæ, and of *Galen in libro de utili. part.* they are called *Fagotides*, becauſe they are near unto the paſſage of the meat, and of ſome *Carotides*, or *Somni*; but *Celſus* calleth the Arteries onely that remain there, *Carotidas*, called ſo of ὑπνός, which is *Somnus*, ſleep; becauſe according to ſome, for the moſt part, there is an opilation made in the branches of thoſe Arteries, cauſing ſleep, and alſo the Apoplexy.

And of thoſe Veins there is on both ſides one immediately under the Skin, which is commonly called, *Guidez manifeſta*; alſo on both ſides under ſome notable muſcles of the Neck, is one Vein, which is called *Guidez occulta*, and *Profunda*, the hidden and deep *Guidez*, which is fellow to the Artery *Carotida*.

With thoſe profound Veins and Arteries, there is on both ſides aſſotiated one Nerve of a notable greatneſs, which is called, *Deſcendens*, from which do ariſe on both ſides the *Reverſives*; of all which

which ſpeech ſhall be made a little below.

Alſo the former part of the Neck, is called of ſome *Jugulum*, and of ſome *Gula*; although not well; becauſe *Gula* is the paſſage of meats and drinks; and *Jugulum* is that part which is immediately above the upper *Furculaes* of the Breaſt; nevertheleſs ſome call the aforeſaid *Furculaes*, *Jugulum*, and *Clavis*, and *Clidas*, and *Clidia*; the extreamity of theſe *Furculaes* toward the *Spatulaes*, is called *Eponis*; but the other part toward the middle of the Breaſt, is called, *Parasfagis*.

The aforeſaid things being noted, the Anatomy of the muſcles, moving the Neck and Head, ſhould occurre after the Skin: but wee cannot have the perfect demonſtration of them, unleſs the Anatomy of thoſe Nerves, Veins, and aforeſaid Arterics ſhould bee deſtroyed; therefore wee will bee ſilent of theſe, referring the Readers to *Galen*, and to *Avicen*, and

to

to other Authours; for these muscles are many in number, and diversly placed, and therefore they should be seen with diligence, for the finding out of which, you should attend to them onely, because they are Anatomized with difficulty; and for this *Galen*, 12 *de util. part. Cap.* 8. where hee speaketh of these muscles, said, it concerneth him to be diligently afore-exercised, who studies certainly to follow these things here spoken of; he saith also in the same place, that speech only is not sufficient in Anatomy, but there is required touching and seeing, and therefore let there be refuge to the aforesaid Authours, because wee should attend to the Neck and Head onely, in which are many muscles, as well about the Spondiles as elsewhere, which in a common Anatomy cannot bee seen.

For the Head, by means of the Neck with its bones and muscles, hath many motions, whereof some, witness *Avicen*, *prima par-*

partitione primi libri, are proper to the Head, and ſome common to it, and to the five Spondiles of the Neck; by which there is a compound motion of the declination of the Head and Neck together; and thoſe motions doe either bow forward or backward, or on the right, or on the left, and between them is a motion of converſion or turning about; and thoſe muſcles are many and great, becauſe the Poſition of them is of many ſhapes; and alſo, becauſe they have great, and almoſt continual motions; therefore *Galen* (in the place afore,) ſaid, that they compaſs about the Head on every ſide, which they move unto any part that you would decline it; concerning the number of them, there is diſcord between *Avicen* and ſome of his Companions contrarying him.

Therefore the enquiry of them being partly left alone, inciſe the skin from the ſides of the neck, laying bare the lateral and anteriour muſcles, above which immediately

mediately under the skin you ſhall note the Vein *Guidez manifeſta*, which you reſerved unhurt; after that inciſe thoſe great Muſcles, deſcending obliquely from the ears even unto the upper *Furculaes*, towards the middle of the Breaſt; under which on both ſides is one *Glandule*, to the form as it were of an Almond; which is filling the empty places there remaining between the Veins and Arteries, about the lower part of the *Epiglottis*; and therefore it is called *Æquatrix partium colli*, the equal divider of the parts of the Neck; which alſo it moyſtneth in neceſſities; you ſhall alſo obſerve under thoſe glandules on both ſides one notable Vein *Guidez*; and in like manner one Artery fellow to it, which are called *Occultæ*, and *Apopleticæ*, many names of which are ſpoken of above.

Neer unto the aforeſaid Arteries and Veins you ſhall alſo note one Nerve, on both ſides, compounded of many Fibers; theſe

Nerves are called descending, and the reversive Nerves doe spring from these, of which a fair enquiry shall be made below.

Keep those Nerves, and the branches of the aforesaid Artery, and either Vein, to wit, the hidden, and the manifest, untill that you have seen the Veins and Arteries ascending from the Heart, and from the Liver, even unto that place, for the seeing of which the Work-man may return back again about the region of the gibbous part of the Liver, and there hee will note a great trunk of the Vein *Chilis* ascending; which in its ascension first perforateth the Midriff, and there sendeth forth many little Veins on both sides, whereof two doe feed the Midriff, but the rest doe nourish the lower ribs, and the members near unto them. But a very great branch of it ascending reacheth even unto the Heart, being every way loose, without an Artery fellow to it, and by that branch the gibbous part of the Liver is vented, and perhaps vivified. This

This branch is divided into three parts, one whereof much leſs than the reſt entreth about the roots of the Heart, and is diſperſed through the ſubſtance thereof, and nouriſheth it.

Another bigger than the reſt is united to the right manſion of the Heart, and bringeth bloud very plentifully to it.

From that branch (according to ſome) that Vein called *Arterialis*, which nouriſheth the Lungs, taketh its original: but of theſe Veins wee have ſpoken ſomewhat in the Section of the Heart.

The third Branch of the aforeſaid, which is alſo notable, aſcendeth alſo above from the region of the Heart, under which is a certain glandulous fleſh called *Morum*, and *Timum*, and this, together with the fifth lobe of the Lungs which cleaveth to the back, is (as wee have ſaid before) a Mattreſſe, or Bed to the aforeſaid Branch, aſcending even unto the higheſt *Furcula* of the Breaſt; where this Vein is parted

into two branches, reaching transverse towards the *Spatulaes* on the right side, and on the left; in that same manner also doth the great Artery, called *Aorta Ascendens*, reach transversly toward the *Spatulaes*; and that you may the better see those Veins and Arteries, lay aside the upper *Furcula*, yet warily, lest you loosen the members near unto them.

Those things being dispatched, you must see the aforesaid Veins and Arteries, noting first that every one of them is divided into two Branches, one whereof as well of the Vein as Artery ascendeth by the Neck on both sides towards the Head, from which doe arise all the Veins of the Neck called *Guidez*, which you shall keep to be better seen afterwards.

Another Branch also on both sides is divided into five parts, one of them nourisheth the upper Ribs, and one the place of the *Spatulaes*, and one the deep muscles of the Neck, and one penetrateth in the upper Spondiles of the

the Neck, and from thence paſſeth to the Head, and the branches of the pulſant Vein do aſſociate them.

Another branch greater than all the aforeſaid five, reacheth to the *Axilla*, or Armpit, and this is divided into four parts, one of them is ſpread in the muſcles placed above the Breaſt, which move the *Spatulaes*, and one entteth in the looſe fleſh, and in certain Panicles of the *Axillaes*, and one goeth from the upper part of the Breaſt about the Teats, deſcending toward the *Abdomen*; and this (according to ſome) nouriſheth them, and in part carrieth the matter of milk to them; and this (as wee have ſaid elſewhere) is coupled in the *Abdomen*, with a Vein aſcending from the *Inguina*, and from the Matrix to the Teats; and of that branch *Galen* ſpeaketh, in 14 *de utilit. part. cap.* 8. ſaying. That from the *Thorax* do reach Veins to the *Hypocondria*, and to the whole *Epigaſtrion*, and are coupled with Veins which are

carried from the lower parts to the Matrix, having Colligancy, that when the living creature is increaſed in the Matrix, they might bring in the nouriſhment for it; which being born, they puff up the Teats again; wherefore it hapneth, that the *Menſtrues*, and to give ſuck, cannot well be together.

But another branch greater than the aforeſaid, is divided on both ſides into three branches; one reacheth to the muſcles which are in the *Spatulaes*, and one to the muſcles of the *Axillaes*, but another bigger than the aforeſaid, reacheth by a neer part toward the *Adjutorium*, and this goeth unto the little hand; this branch is called *Aſellaris*, and *Baſillica*, which being flebotomized, helpeth in diſeaſes of the Breaſt, by reaſon of its neer Colligancy unto the true Ribs, and to the whole Breaſt; this Vein is alſo called of the Vulgar, the Liver vein, becauſe it is neerer to it than the *Cephalica*.

But

But of the first branches (which I spake that you should keep) from which are made the *Guidez*, there ascendeth on both sides one, and before they do much ascend, they are divided into two parts on both sides; one of them is called, *Guidez manifesta*, the manifest *Guidez*, because it is neer unto the Skin, easily apt to bee seen, which in one living swelleth in a strong voice; but the other, because it is below some muscles, is called, *Guidez profunda & submersa*, the deep and overwhelmed *Guidez*.

And indeed the manifest *Guidez*, presently when it ascendeth above the *Furcula*, is divided into two parts on both sides, whereof one ascendeth, but the other is involved about the *Furcula*, from which do arise many branches, nourishing the parts neer unto them, and some of those branches do again ascend, and are united again with the aforesaid first branch of the manifest *Guidez*; but before they are united,

one notable branch reacheth to the *Spatula*; and by the outside, under the Skin of the Adjutory, is terminated even unto the little hand; and this is called, *Spatularis*, *Humeralis*, and *Cephalica*, because it helpeth the Head, by reason of the neer Colligancy that it hath with its *Guidez*, that nourisheth the Head; but of that Vein, *Cephalica*, and also of *Basilica* and of the Artery fellow to it, it shall be spoken more amply in the particular Anatomy of the great and little Hand.

And the aforesaid manifest *Guidez* on both sides notable, is immediately under the Skin above the muscles of the Neck, which with its branches doth nourish the upper and lower Mandible, and the Tongue, and the Head, ascending on the outside, about the Ears.

And some would have that those branches of the manifest *Guidez*, which are about the Ears, should be called, *Venæ Spermaticæ*, because they say, that the Sperm

Sperm cometh by them from the Brain; and they are moved from the ſayings of *Hippocrates*, in his Book *de aere & aqua*, which ſaith, that whoſoever have the Veins behinde the Ears cut, they are altogether deprived of all Generation; nevertheleſs there are ſome that think, that ſuch Veins are from the branches of the profound *Guidez*, which nouriſh the muſcles remaining between the firſt and ſecond Spondile of the Neck; and ſome which ſay, that *Hippocrates* did underſtand by the Veins the very Arteries, becauſe they are more fit for good Sperm than the Veins; nevertheleſs *Hippocrates* ſaith in the ſame place, that Sperm alſo cometh from the whole and *Avicen*, 20 *tertii cap.* 3. ſaith, that *Galen* knew not whether the inciſion of theſe Veins may cauſe barrenneſs to incurre or no: nevertheleſs he ſaid, but it ſeemeth to mee that it doth not matter that the Sperm ſhould bee of the Brain onely, although the nouriſhing of it be of the Brain; nevertheleſs

theleſs it is gathered by the good Anatomy of the Spermatick veſſels, that the inciſion of theſe Veins behinde the Ears maketh not barren, by reaſon of the Sperm deſcending by them; nevertheleſs thoſe Veins being cut, may weaken the Brain ſo, that it may not duly ſend the Animal ſpirit for conception; and this the profound *Guidez* may rather do than the manifeſt, and the Arteries may rather do this than the Veins, becauſe they are the carriers of the Spirit; but either is poſſible.

But the profound *Guidez*, on both ſides neer to the *Meri* or *Gula*, aſcendeth below the aforeſaid muſcles which you cut, and in its aſcent ſendeth forth branches, nouriſhing the *Gula*, and the muſcles of the *Faringa*; they alſo nouriſh the muſcles remaining between the firſt and ſecond Spondile of the Neck, from which (according to ſome) the Spermatick Veins recited of *Hippocrates*, do ariſe, which are behinde the Ears, of

which

which there is yet a controversie.

They also nourish the *Pericranium*, ascending by it from the bottom, even unto the top of the Head; and there by perforating the *Cranium*, they descend to the *Dura*, and *Pia Mater*, carrying nourishment to them.

Also from the aforesaid profound Vein, doth arise one branch on both sides, piercing the bone *Basilare*, in the direct of the commissure *Lambda*; and being born up of the *Dura Mater*, it ascendeth even unto the top of the Head; and from that in the same place do go forth many branches through the pores of the Skull, which also do nourish the *Pericranium*; nevertheless the greater part of the aforesaid branches ascending within the Skull with the *Dura Mater*, do pass into the *Pia Mater*, with which also do pass some branches of the aforesaid manifest *Guidez*, piercing the Skull on the top of the Head from the outwatd to the inward part,

and

and from hence they pass to the substance of the Brain, and nourish that.

Also some of the aforesaid Branches in the direct of the *Commissure Sagittalis*, and *Lambda*, doe enter into the *Dura mater*, being doubled in that place; and this place is as it were a presse of which the bloud is pressed out from the aforesaid Veins, into a certain large place being near there, towards the outside, which is called *Platea Fovea*, *Palmentum*, and *Lacuna*; about which *Platea* are certain Veins sucking the bloud pressed out into it, which out of the same doe nourish the center of the Brain; and all those Veins within the skull, together with the Arteries, are those of which it is rightly called *Secundina*; and otherwise it is called *Pia Mater*. But the aforesaid Arteries called *Carotides*, being in the Neck, near to the Veins *Guidez*, and the descendent Nerves, ascending on the sides of the Neck on both sides, doe reach with some Branches dispersing here

here and there before, and alſo behind, and to the Tongue, and to the upper Mandibles, and the lower; and in the whole face, and in the hinder part of the Head, and ſome notable ones about the Ears, in the Temples, doe reach with their Branches to the top of the Head; and ſome alſo reaching to the muſcles about the common juncture, are ſpread abroad to the Neck, and to the Head, where there is a great hole, from which the ſpinal Marrow goeth forth; it may bee from thoſe branches *Hippocrates* ſaid, that Sperm deſcendeth from the Brain, becauſe the Ancients did call the Arteries alſo Veins; and therefore *Avicen* ſaid, twenty *tertii*, that theſe Veins were continued to the Nuke, that they might not bee farre off from the Brain, in which there is light milkey bloud, which goeth firſt to the Reins, forthwith after that to the Veins reaching to the Teſticles; and one notable Branch of theſe Arteries on both ſides pierceth the bone, *Baſilare*

ſilare toward the former part, and is united to the *Pia Mater*, giving life to the Brain, and carrying ſpirit to the Ventricles thereof.

From that Branch aſcended on both ſides immediately above this bone *Baſilare* (according to the Hinges of Phyſick) is made the *Rete mirabile*; which is (according to them) of a notable magnitude, which is before, behind, and on the ſides.

And the aforeſaid Veins nouriſhing the Brain in their aſcent muſt bee ſuſtained of ſome ſolid body, as is the *Pericranium*, and *Dura Mater*, becauſe they cannot aſcend by themſelves for their ſingle and ſoft coat, and the bloud in them is more apt to deſcend than to aſcend, becauſe it is heavie.

But the Arteries are not joyned to any ſolid body, but ſtanding by themſelves do aſcend too within the Skull, becauſe they are double coated and hard.

And it was not neceſſary that they ſhould aſcend, and afterwards turn their heads dowuward

as the Veins, because their bloud is light, and more apt for ascending than descending.

Yet you shall better see the branches of those Veins, and also of some Arteries in the Anatomy of the Members following.

The substance of Veins and Arteries hath been spoken of in another place; their complexion is judged from the composition of them; their shape is known, they have Colligancy with the whole body; their bigness is also known; they are bigger in one body than in another; But the situation of many of them is often varied; in number they are unperceiveable, because many of them are hidden; their helps are to feed all the members; they also suffer passions of all sorts, but there often hapneth to them a streightned opilation, caused from the fulness of bloud, which if it bee made in the branches of the Veins *Guidez*, there always followeth profundity of sleep, the Apoplexie, and extream suffocation.

That

That Vein *Guidez* is ſometimes flebotomized, yet ſeldome in our Region and Age; its inciſion helpeth the Leproſie not confirmed, and in a ſtrong ſquinancy, in a ſharp *Aſtma*, in ſtraightneſs of breathing, in hoarſneſs of voice cauſed by ſuper-abounding of blood in an Apoſtume of the Lungs, for evacuation and diverſion ſake, for the antecedent cauſe, in the beginning and augmentation; nevertheleſs this inciſion of the Veins *Guidez* is to bee made by a learned hand, with a Flebm or Lancet, having ſome Obſtacle neer the point, leſt all the ſides of the Vein be opened, for theſe Veins are ſlippery in the touching of them, becauſe they are not annexed to the fleſh, as many others, as well alſo becauſe of the ſoft and ſlippery glandules being under them; as alſo, leſt the Flebm ſhould prick a Nerve or other members placed there.

But the manner of flebotomizing theſe Veins, is thus; firſt, let the lower Belly of the Patient be

be bound, between the *Ilia* and *Hypochondria*, with a girdle decently binding; let him also hold his mouth shut in expelling the air from the Breast; then let the Patient decline his head to the contrary side that is to bee let bloud; because by doing so the Vein swelleth as a Chord extended, and with a fit instrument holding the Vein firm with the hand, or other device, the Vein must be peirced in the more eminent place.

Authors commend such a Section to bee made according to the breadth, nevertheless I would doe it obliquely, and let not the quantity of bloud bee superfluous, neither let it bee done the second time; and let the Work-man have with him powders constringent for stopping of Bloud, as *Bole-Armonick*, *Sanguis Draconis*, the hairs of a Hare, Mummy, the barks of Frankinsence, Aloes, and the like, and among all let him have Vitriol, or Colcotar, also Soot is praised, and burnt Beans, and Paper burnt, Skins, and

he like to these, the white of an Egge well beaten being always laid over, and with decent Ligature, and the Patient lying with his head lifted up for eight days, with light sleep, and decent diet, as farre as it shall seem good to the lawful Physician.

Of the Anatomy of the descending and the Reversive Nerves.

Nervus ex νεῦρον quod ex νεῦω nuto, & flecto: quia Nervi instrumenta voluntarii motus. Galt

THe Anatomy of the Veins ascending from the Liver upward being dispatched, in which also many things have been spoken of the Arteries ascending, I return to the descendent Nerves, from which the Reversives doe arise; and I say, that in the lateral parts of the Neck, a little under the Ears, between or under some Muscles, are notable Veins, and Arteries (as it was manifested before) to which on both sides there doth adhere one notable Nerve called Descendent; these Nerves the Ancients did call *Apoplecticos*: and not well, because they

they did not know the operations of them, witneſs *Galen* in his Book *De Voce & anhelitu* : And theſe Nerves doe ariſe principally from the ſixth pair of the Nerves of the Brain, and they riſe alſo from the third, and deſcend perpendicularly, becauſe in ſuch ſort they muſt move the members.

Theſe Nerves are compounded of many branches, whereof ſome by deſcending (witneſs *Galen*) are ſpread abroad to the Heart, and to its *Capſula*, to the *Mediaſtinus*, and likewiſe to the Breaſt in the roots of the Ribs, and ſome notable enough to the mouth of the Stomach, and to the *Diafragma*, and ſome leſſer to the Liver, to the Spleen, to the Kidnies, and to other ſenſible members of the lower Bellies, to which alſo doe goe certain Nerves obliquely deſcending from the Nuke, and from thoſe Nerves deſcending ſome notable branches are again turned back upward, which are called *Reverſivi*, and *Retro Redeuntes*, which are commonly called the

Nerves of the Voyce, and they reach toward the *Epiglottis*, binding themselves with certain of its muscles, whose heads are placed at the lower parts of its body.

Some branches also of the aforesaid descendent Nerves (besides those Reversives) doe goe likewise by descending to some of the Muscles of the *Epiglottis*, the heads whereof are turned upward, and they are Reversives (as it pleaseth some) with their muscles they shut the cartilage *Cymbalaris*, and *Glotida*, but the muscles of the descending Nerves doe move other Cartilages, and also they open the *Cymbalaris*.

From the seventh pair also, and from the *Nuca*, doe come Nerves to the muscles of the *Epiglottis*, which doe move it obliquely, (witnesse *Galen.*)

Those Nerves are two; one right, the other left, nevertheless they are divided into very many Fibers, or branches, as it appears, because of the many members to which they goe.

Their

Their quantity and colour is apparent; their complexion and ſubſtance is ſuch as of other Nerves, yet the Reverſives are drier and harder, becauſe they are to bear notable, and as it were continual motions, eſpecially when they ſhut the *Epiglottis*, to which ſhutting there is required a ſtronger motion than to the opening of it, becauſe there are more muſcles opening than ſhutting it; alſo the motion of the Heart, of the Lungs, and of the Breaſt doth open it; and therefore that ſuch Nerves ſhould bee ſtrong, Nature hath ſet them afarre off from the moyſt Brain, from which by how much the more they are diſtant, by ſo much the more drier are they; and they paſs near unto the Heart about the Artery, where perhaps by reaſon of its heat they doe obtain drineſs and hardneſs, and they are turned back upward, that by drawing downward they might ſhut the *Epiglottis*, which when they are relaxed, many other muſcles helping, the *Epiglottis* is opened.

Their ſituation is on the ſides of the Neck deſcending to the aforeſaid members, but the Nerves which are called *Reverſivi*, in the left ſide begin to bee turned back to the upper parts, when they meet with the great Artery *Aorta* in the place a little above the Heart, where that Artery is firſt forked, and beginneth to bee turned back through the Breaſt to the lower members, about which great branch deſcending is made the motion of the attraction, and relaxation of thoſe Nerves, and that bifurcation of the Artery is to thoſe Nerves as a wheel upon which water is drawn from a Well with a cord; and this place as well on the left as on the right, about which theſe reverſive Nerves are moved, or to which they are joyned in their motion, is called of *Galen*, *Diabluns*, and *Flexor*; it is alſo called of ſome *Girgilus*, and *Bachan*, and *Galen* in his eighth Book, *De juvamentis*, *cap.* 2. doth reſemble that reverſion of the Nerves, to thoſe that with

with Horſes in a Camp are turned back to the way from which they firſt came, and ſaith, that it is as it were a turning back of a thing upon a ſmall wheel; and in the ſeventh, *De Utilitate, cap.* 14. hee ſaith, that he firſt of all found out thoſe Nerves placed in that manner, and their Muſcles, having the heads of them downward.

He ſaith alſo, that that reverſion of thoſe Nerves ſheweth, that the Nerves have their original from the Brain, and not from the Heart, as *Ariſtotle* did think, for if the Nerves ſhould have their beginning from the Heart, thoſe Reverſives ſhould come from it, and not from the Brain, as it appeareth to ſence.

And to thoſe Reverſive Nerves of the right ſide Nature hath alſo made the *Girgilus* (or that wheel which ſhee made in the left ſide) of one ſufficiently noted branch of the Artery aſcending, being obliqued toward the right Armpit, about the upper *Furcula* of the Breaſt of the right ſide, which

Artery goeth to the right Arm, to which branch it hath joyned other Pellicles remaining there, that it might bee ſtrong, becauſe this branch is not ſo great as is that about which the reverſive Nerves of the aforeſaid left ſide are turned back.

And under that branch of the right ſide, fortified of the aforeſaid Pellicles, doe the right reverſive Nerves aſcend by the Neck; and as well thoſe of the right as of the left are by aſcending, implanted to the muſcles of the *Epiglottis* with many branches, as it appeareth to ſence, by means of which they move the *Epiglottis*, or *Laringa* voluntarily, as a Rider, by means of his Bridle and Reigns, moveth the Horſe when he liſt.

The helps of the aforeſaid deſcending Nerves are to give ſence, and ſome motion (according to ſome) to the members to which they goe in their deſcent, concerning which it was ſpoken before; and the helps of the Reverſives

verſives are for the giving of the Voyce; and therefore they are called *Nervi vocis*, the Nerves of the Voyce, as well the deſcending as the Reverſives doe ſuffer paſſions of all ſorts; and if their complexion bee notably changed, as ſometimes it hapneth in the uncovering of them by reaſon of an Ulcer, eſpecially of the deſcending, and happily of the Reverſives, the Voyce is loſt, and their other operations, if they bee not taken away, they are at leaſt diminiſhed; and if the Reverſives only ſhould bee wholly cut on both ſides, the Voyce and the Speech is loſt; but if in one ſide only, the half of the operations is hurt; but if the deſcending bee cut, of which the Reverſives bee parts (according to ſome) thoſe Five Operations will bee hurt, of which *Galen* maketh mention, 4 *Interiorum*, *cap.* 15. to wit, *Exitus aeris â pectore cum anhelitu*, a going forth of air from the Breaſt with painful breathing; and *Flamen ſine ictu ſeu ſtrepitu*, a blaſt without ſtroke

ſtroak or noiſe; and *flamen cum ſtrepitu*, a blaſt with noiſe; and *Vox*, the voice; and *Loquela*, the ſpeech; yet ſome will have it, that by the inciſion of the deſcending Nerves, the voice alone, and that blaſt with the ſtroak is loſt; but concerning thoſe Nerves look upon our Commentaries.

Theſe things being ſeen, leave the reverſive Nerves in their place in the Neck, that by them you may the better ſee the muſcles of the *Epiglottis*, to which they are faſtned; leave alſo the upper part of the Ventricle, and all the *Gula* or *Meri*, and that upper part of the Lungs, which you kept for the ſeeing of the *Trachea*; leave alſo ſuch a part of the Veins and Arteries, reaching to the Arms and to the Head, that you may ſee the Anatomy of them in their place; but you may caſt away the Heart and the other members of the lower and middle Belly, which have firſt been ſeen, & kept for the ſeeing of the Veins, Arteries, and Nerves ſpoken of before; & before we

we do further proceed in the present order of Anatomy, some things are to be spoken of the Face, and of some parts of it; afterwards we shall come to the *Epiglottis*, and *Gula*.

Of the Face.

THe Face, called *Facies* of the *Romans*, and of the *Greeks* * πρόσωπον, which is onely to man, is the former part of the Head known to all: this part should rather come to bee Anatomized with the upper Belly than with the middle, but for the present wee speak of it by the way, because in a common Anatomy the *Gula* or *Meri* cannot be shown, unless there be first mention made of some parts of the Face, and *Facies* is said, *quasi faciens hominem*, making the man; for by it is the knowledge and distinction of every person.

This part called *Facies*, is also called *Vultus a Volvendo*, of rowling, and so called a *Volendo*, of Willing,

* πρόσωπον *quasi* πρός ωθεν ὄπωπον *hoc est quod antrorsus videat. Cas. Bauhi.*

Willing, becauſe by it rhe affections of the minde are known, in which the colour of it is changed, either for baſhfulneſs, or for ſome fault committed, or for fear, or ſickneſs; nevertheleſs there are ſome whoſe countenance is ſeldom changed, and thoſe are called *Vultuoſi*, brazen faced.

Alſo the countenance is changed from age to age, and the Face differs from the countenance in that, becauſe the Face is alwaies the ſame, and the countenance is changed; albeit the Face may change its colour and quantity by age; and the knowledge of the Face is much conſidered of the *Phyſiognomiſt*; it is alſo conſidered of the Phyſician; as in the firſt Prognoſtick you ſhall firſt conſider the Face of the ſick man, for it helpeth in the knowing of many diſeaſes, as the Leproſie, the *Periplemonia*, the yellow Jaundice, *cachexia*, and the time of *Menſtrues* in a woman; in that they are alſo known that counterfeit ſickneſs, but not alwaies.

Its situation is under the former hairy part of the Head; its substance is of more rare and soft Skin, than any other Skin of the body, of the vapours ascending to it from the whole; and for comelinesse sake, under that Skin are many Muscles and Veins, pulsant and quiet, Nerves, Pannicles, Ligaments, Cartilages, and Bones; in number it is one Organical member.

The number of the parts of it, is the Forehead, the Temples, the Ears, the Eyebrows, the Nose, the Eyes, the Eyelids, the *Cilia*, or hair of the Brows, the Cheeks, *Maxillæ*, or *Mandibulæ*, the Jaws, which are here *Synonymaes*, the Mouth, and the ball of the Cheeks, the Lips, *Gelasini*, the foreteeth, *Mystax*, the *Mustache*, the trench or hollow place under the Nose, and the Chin, with its trench; its quantity, its figure, and Colligancy are apparent; its complexion is such as is the complexion of the parts of it; its helps are also to be gathered from

from its parts; it suffereth passions of all sorts.

Frons a ferendo quod animi indicia præ se ferat Ca. Bauhi.

Of the Forehead, and the other parts of the Face, the Nose, the Eyes, the Eyelids, the Cilia, *and the Mouth, with the parts thereof excepted.*

FRons the Forehead, is all that middle upper part of the Face without hairs, which is above the Eyes; nevertheless it is said of some, that the Eyes are in the Forehead; and therefore witness *Varro*, it is called, *Frons a foratu Oculorum*, from the boaring of the Eyes.

Under the Skin of the Forehead, is dilated one muscle, having its Fibers according to the length of the body, by which it moveth the Eyebrows; in the Forehead are also wrinckles, reaching according to the breadth of it, according to the situation of which, Empericks do cut their Abscessions, (but ill) because then the Eyebrows do fall; therefore

the

the incisions in the Forehead ought to be made according to the length of the body.

In the Forehead are some Veins which are cut in diverse diseases, and Horse-leeches also are applied to them; under the aforesaid muscle is the *Os Frontis*, called *Coronale*.

Of the Temples.

Tempora dicuntur quasi ætatis tempus & annos sua canitie & macilentia prodant.

ON the sides of the Forehead, are the Temples, called in Latine * *Tempora*, which is times, because in them are known the years of many living creatures; for they first wax gray in man, but not alwaies; they are also made hollow in the long continuance of time; in the Temples are little bones, somewhat long, reaching overthwart the Head, which do keep the Temporal muscles within them, and the Skull; these bones are called of *Avicen*, *Ossa paris*; and beyond the aforesaid muscles in the Temples, there are also some Arteries, and notable

Veins,

Veins, which in some diseases are incised.

Supercilium qui supra cilium nascuntur crines; cilium vocatur vel a cilleo quod sepius movetur vel a celo quod celet oculum.

Of the Eyebrows.

Supercilia the Eyebrows, are known to all, whose situation is in the ending of the Forehead; they are bred together with a man for ornament sake, intended of nature, that they might defend the Eyes from dust falling, and from rain, and the like; its hairs do not increase as those of the Head, for a good ends sake.

Of Intercilium, *or the space between the Brows.*

IN the bounds of the Forehead is a certain space between, dividing the Eyebrows in the middle of them, it also divideth the Forehead from the Nose; and to this part as to a center, are bounded the Nose, and the lower and middle part of the Forehead; this part is called *Glabella*, or *Glabra*; for *Glaber* is interpre-

preted, *Sine pilis*, without Hair; this place is also called, *Lepor nasi*, the comelineſs of the Noſe: in that place do often begin *Erisipilas*, called by another name, *Gutta Rosea*.

Of Malis, *the Cheeks.*

Mala contract. ex maxilla cicerone, vel ex mali similitudine.

Malæ are thoſe round parts in the Face, which are also called *Pomæ*, and they are below the Eyes on the ſides of the Noſe, and they are onely to mankind; and they are properly called *Genæ*, although the greater part of the Face may be called *Gena*. The Skin of this part is thinner than any other part of the Face, which is eaſily made red, and changeth its colour in the affections of the mind, which commonly in well complexioned people is of a Roſet colour; thoſe *Malæ* do adorn the Face, and they are a defence to the Eyes, and to the Noſe; and each of them hath one broad muſcle, firmly united to its Skin, which are ſerviceable to them and

to the Lips; as shall bee said hereafter in the Section of the Lips.

Of Barba, *called* Gena, *the Beard.*

IN the Face also is a barbarous part, which hath a proper name, and is called, *Gena, a* γενάω, *genero*, to beget, because the Hairs are created there; this part also of some is called *Mystax*, or * *Mustax*.

Gena Latin: a genero ibi capilli generantur.

*From whence may come our English word *Mustachio*.

Of * Mentum, *the Chin.*

IN the lower part of the Face is *Mentum* the Chin, so called *ab Eminendo*, from appearing above the rest; for it is eminent above the *Gula*; (it is also called, * ἀνθερεών) from *Mentum* its disease is called *Mentagra*; its upper part beginneth from the root of the upper Lip, and hath an end in the lowest part of the Face; and in respect of its place it may bee called

**Mentum a memini Ciceroni quod quibusdam ejus inter recordandum aliquis usus esse videatur.*

* ἀνθερεών *Polluci & Ruffo* ἀπο τῦ θριξιν ἀνθεῖν, *quod pili ibidem floreant.*

led *Mentum*, because they that are lowest ought in all things (if they are not) to be mild.

Mentum vult quasi à miti diduci.

In the middle of the Chin is a certain hollowness, called of some *Buccula*, and *Buccella*, a little Cheek, it is also called *Typos*.

Of Gelasinis.

ON the sides of the mouth, on both sides in the skin (in some persons, and especially in Boyes, and in Women) is a certain little pit, which appeareth in laughter, which sheweth grace and comliness, and therefore those pits are called *Umbelicus Veneris*, and *Gelasinus*, these are also called, *Umbelicus Veneris*, *Venus* Navel, because they are like to the hollowness found in the leaves of the Herb called *Venus Navel*, and *Cotyledon*.

Martiali Gelasinus a γελάω *rideo maxime enim apparens risu.*

Of the hollow pit under the Noſe.

UNder the Noſe, in the middle of the upper Lip is a certain little valley, which *Lactantius Firmianus* for the ſimilitude of its hollowneſs, calleth *Lacuna*, a Ditch, it is called of ſome *Philtron*, and *Sperion*, and *Hyſpia*; concerning the Noſe, the Eyes, the Eyebrows, the Eye-lids, the Mouth, and its parts; it ſhall bee ſpoken in their place, beginning with the Anatomy of the mouth.

φίλτρον *Polluci & Ruffo quaſi amatorium ſive amabile dixeris vel amoris illecebra velut eſſet quoddam in amore illectamentum.*

Of the Anatomy of the Mouth, and the parts thereof.

THat therefore the *Trachea*, *Epiglottis*, and *Gula* may bee fitly ſhewed, as we have promiſed, I come to the Section of the Mouth, and the parts of it; and I ſay, that the Mouth is that hollow part in the face, being immediatly within the Lips, by which the meat and drink, and in part air doe

Os Scalig. ex ὄσσα vox.

doe first enter within the body, and by which Spittles and Voyces goe forth, and in which the Speech is formed, and it is called *Os*, as it were *Ostium*, the door to the aforesaid things, letting them in and out.

But the Cheek or Cheeks *Buccæ*, are those parts in the face or mouth which may naturally bee puffed up of the breath, that is, that hollowness of the mouth which is puffed up of the breath, being brought back from the Lungs, and retained in the mouth the lips being shut.

The parts of the Mouth are the Lips, the Teeth, the Gums, the Jaw-bones, the Palate, the Uvea, the Tongue, the Tonsils, and the Fauces.

From the aforesaid things doth appear the substance, situation, and figure of the Mouth; its quantity is known to all; in number it is one member; the number of the parts of it is spoken of; its Colligancy is taken from its parts, and also its helps; its complexion is

ſuch as are its parts; it ſuffereth paſſions of all ſorts.

Of the Lips.

Labrum a lavando, quidam, eo quod in eo lavationem infantium ſolitum eſt fieri: haud improprie labium à labor dici puto quod ex iis verba elabuntur.

Labia, which are alſo called *Labra*; the Lips in ſome are groſs, in ſome thin; groſs doe commonly argue rudeneſs of wit; the more prominent part of the Lip is named *Prochilum*; the continual joyning of them is called *Proſtomion*, or *Proſtomia*, and thoſe which have their Lips hanging over, and likewiſe their Teeth, are called *Brochi*; in the middle of the Lips is a clift which is properly called *Os*, the mouth.

The ſubſtance of the Lips is compounded of Muſculous fleſh, skin, and a Pannicle continued to the *Gula*; the union of theſe parts is ſo compacted, that one can very hardly bee ſeparated from the other, and it is ſuch, leſt through the groſneſs of it, its nimble motion ſhould bee hindred, which ſerves for every difference of placing, and therefore in them there

are

are four proper Muſcles, and two common to them, and to the balls of the face. And the proper are little, according to the bigneſs of the Lips, which before they are united to the skin are chained together one to another, ſo that their parts are unſeparable without the rending of them, one pair whereof hangeth obliquely under the apples of the face toward the Lips; alſo the other two hang obliquely from the lower Mandible toward the Lips.

And although there are only four muſcles in the Lips, nevertheleſs there are eight motions, witneſs *Galen*, 11 *De Utili. cap.* 16. to wit, four Strait, and four Oblique, for every one of them while it is moved moveth Obliquely, becauſe the ſituation of every one of them is oblique, but when two of them are equally moved, they move rightly, as it is in the opening of them, in which there is one right motion; but the other right motion in the Lips, is when they are ſhut, or preſſed together

gether to one another.

There are also two other right motions in the Lips, one is, when they are turned outward, and the other when they are folded inward; and those motions are made of strait Fibers, some whereof innermost are within those muscles of the Lips, and some are outward; and when the outermost are extended, then the Lips are turned outward, and when the innermost, then they are folded under or inward; and how the Oblique motions are made of one Muscle only, and the right of more, it is easie to judge, if you look into the shuttings of a Purse, which when they are drawn together rightly, and uniformly, they open the mouth of the Purse, and when only one of them is drawn, the mouth of the Purse is moved over-thwart.

Nevertheless *Avicen*, although hee speaketh of the aforesaid situation of the Muscles, setteth down but four Motions, as there are four Muscles; and saith, that

four Motions is sufficient for them; hee saith, that every part of them when it is moved, moveth to its own part, and when two, they are moved to two parts, and are dilated to two; they have therefore a perfection of their motion to four parts, neither have they any other motion besides them.

And as well *Galen* as *Avicen* doe speak of the proper motion, because the motion common to the Cheeks, and Lips, is made of two broad Muscles, which are in either Mandible; and the broad ones are bigger than the aforesaid, and those, witness *Galen*, are outward from the Cheeks unto the spine of the Neck, unto which doe pass Nerves from the Breast, and from the Clavicles, that is, from the upper *Furculae* of the Breast, which are implanted into the Cheeks, and into the lower Lip by right Fibers, and some other Fibers, reaching also from the Clavicles obliquely, and some other more oblique than the aforesaid, ascending from the *Scapulae* to

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the sides of the Lips are implanted in the Cheeks; and moreover, some other do reach from the place behind the ears (which sometimes they move) unto those Muscles; nevertheless those muscles are not manifestly known, although they have a multitude of Nerves almost from all the parts of the Neck; yet they are known if the Lips and the balls of the face bee moved, when the Mandibles are shut to their uttermost power; not because the bony parts of the Cheeks may be moved, but their aforesaid fleshy musculous part is moved with the skin, which is properly for the only motion of the Lips; to which part, and also to the very Lips the aforesaid Broad Muscles doe goe, which move the Lips, and the Cheek-balls, and this is called the common motion that is of the Lips, and of the Cheek-balls.

Some also would have that the Cheek-balls in their upper part be somewhat moved of the Broad Muscle moving the fore-head, and some

some say, that those Broad Muscles moving the Cheeks and the Lips, doe also help the chawing.

And the motion of those muscles are best seen in those which are living, especially in them that are lean, and therefore I make mention of them, omitting the Anatomy of many muscles, because they may not bee seen in those that are living, neither bee shewn in a common Anatomy; I will also declare the Anatomy of the Tongue, and Mandibles for the same cause.

These Lips within themselves, and also the whole mouth are covered with a Pannicle, covering the *Gula*, or *Meri*, and the Stomach, and for this the lower Lip doth tremble when one is ready to Vomit: but this Pannicle is harder and thicker in the mouth than any where else, and grosser in the *Meri* than in the Ventricle, and always as it descends it is made more soft and subtile, because in the mouth it first meeteth with meats somewhat hard, which as they

they descend are alwayes made softer, witness *Galen* 4. *De utilit.* and according to that of *Avicen*, that one feeding, receiveth some digestion by chawing.

The Figure, situation, quantity, and number of the Lips doe appear; their complexion is set down hot; they have Colligancy with the Brain by Nerves, with the Liver by Veins, with the Heart by Arteries, and therefore sometimes in the compression of them the effects of the mind are known; the Lips also are stretched out, and restrained voluntarily; they have also Colligancy with the Ventricle, and *Meri*, and with the whole body by means of the Skin; their helps are many, they are first for the defence of the Teeth, and for the good form of the Face, for the expressing of the Speech, for the taking of meat and drink, and they are to the mouth as a door to a house, necessarily opening and shutting themselves; they also hinder the Air from entring cold to the

Heart

Heart by it ſelf, and by accident; they alſo retain the Air brought back from the Lungs in neceſſities.

They endure paſſions of all ſorts, and among others they ſuffer *Ragadias*, Chaps, and oftentimes Cancers and trembling in *Criſiſes*, and in Feavers by participation from the Brain, and from the Ventricle.

Of the Teeth.

THe aforeſaid things being ſeen, you may firſt open the mouth as much as you can, by cutting the Cheeks on each of the ſides, that you may the better ſee the Teeth and the Gums; firſt noting the ſubſtance of the Teeth which is bony, and is harder than a bone (witneſs *Celſus*) nevertheleſs ſome ſay, that they are of the nature of fleſh and bone, both becauſe they feel, and becauſe they are renewed again; they alſo doe encreaſe all the time of their endurance for their ends ſake,

Dens quaſi edens, ab edendo.

ſake, becauſe if they ſhould not encreaſe they would not laſt, and the chawing would bee nought, from whence the life would bee ſhort.

In number they are thirty two, to wit, in one rank, neer unto either Cheek there are placed ſixteen, they are alſo oftentimes twenty eight only, becauſe then the four hinder teeth are wanting, which of *Avicen* are called *Negnegid*. and theſe are two in either ſide, and ſometimes they want ſix in all, and the *Negnegids* are the laſt in coming, which are called alſo the Teeth of underſtanding, of ſenſe, and of wiſdome, becauſe in ſome they are bred in Man-hood, or in Old age; and witneſs *Ariſtotle* 2. *De Natura ſeu de Hiſtoriis animalium*; the Male have more Teeth than the Female, as it appeareth in the Sex of Women, of Sheep, of Sows, and of ſhee Goats.

The names of them are other of *Celſus*, other of *Galen*, other of *Ariſtotle*, other of *Avicen*, other of

of *Mundinus*; and first these are the names of *Avicen*, for in every part, whether in the upper, or in the lower, or in the middle of the mouth toward the fore-part, beginning in the middle, there are first two equals somewhat broad, called *Duales*; at the sides of which on both sides is one, which of *Mundinus* is called *Incisivi*, and of *Avicen* are called *Quadrupli*, yet *Galen* called the *Duales Incisivos*, which two *Duales*, and two *Incisivi*, *Celsus* calleth *Quaternos*, and *Aristotle* called all these *Acutos*, that they may cut, and it agreeth with *Galen*; on the sides of them, on both sides is one, which are commonly called *Cynodentes*, or *Canini*, Dog-teeth; and of some they have been called *Gelasini*, because they appear in laughter more than the rest,

Then all the rest (according to *Avicen*) are *Molares*, *Grinders*, called a *Molendo*, from grinding; which in some (according to him) are on both sides four, on the sides of the Dog-teeth, and in some

some they are five, and in that manner they are thirty two, or twenty eight, numbring them thus; two Duales, and two Quadruples, or Inciſives, and two Dog-teeth, all which are ſix, and the Grinders (according to *Avicen*) are ten, or eight; if ten in either part, to wit, in the upper, or in the lower, they are in all ſixteen, and as ſo, they are thirty two, but if they be eight, they are in either part fourteen, and ſo they are twenty eight.

Nevertheleſs *Mundinus* in the number thirty two, placeth two Duales above, and ſo many below, and two Inciſives, and two Dog-teeth, and four Molares, and ſix Maxillaries, yet neither *Galen*, nor *Ariſtotle* doe appoint particular names of all the Teeth, but *Celſus* appointeth four Dog-teeth, on either ſide two, next to the *Quaterni* above, and as many below; *Celſus* alſo appointeth eight Maxillaries above, and eight below, to wit, four on both ſides next to the Dog-teeth.

Their

Their ſhape is diverſe, for ſome have only one ſharp head, and one root, as all the Duales, and the Quadruples, or Inciſives, and the Dog-teeth.

But the lower Molares have at the leaſt two heads, and two roots, and ſometimes three, and as many heads, and eſpecially the fartheſt; but the uppermoſt have at the leaſt three heads, and as many roots, and ſometimes four, and eſpecially the fartheſt, which are as it were a wall holding the others firm; and the roots of the upper Teeth are crooked, that they may bee the ſtronger, leſt they ſhould fall by their own weightineſs; and the holes in which they are faſtned are wondrouſly fitted to them.

And from the Jaw-bone doth ariſe for every Tooth one round additament, faſtning the Tooth by means of the ſtrong Ligaments; and thoſe additaments *Galen* called *Præſepia*, which are not only in the place of the Gums, but in the extream of their roots.

And the Molares have more roots than the reſt, becauſe their operation is more continual than the reſt, and becauſe in chawing they are not moved upward and downward only, but they are moved laterally, or circularly.

All the Teeth have ſome ſence, (witneſs *Galen* and *Avicen*) their quantity and ſituation are apparent; they have Colligancy with the Mandibles and Gums, and with the Brain by the Nerve; their complexion is known, their helps are to prepare the meat for the Stomach; they alſo accent the Speech; they are alſo the weapons of Nature.

They ſuffer every kind of Diſeaſe which other Bones doe ſuffer, in them there is pain, commotion, corroſion, putrefaction, congeling, alteration of colour, and elongation from their Natural place.

Of Gingivis, *the Gums,*

AFter the Teeth are to be ſeen the Gums, *Gingivæ*, ſo called, a *Gignendis dentibus*, from the begetting of Teeth; and they are ſimple fleſh, hard, in which the Teeth are infixed; in them there are ſo many holes as there are Teeth.

In number they are two, the one above, the other below; their ſhape appeareth, which followeth the ſhape of their Jaw-bone; their ſituation alſo appeareth, and their quantity, and their Colligancy; their helps are to make firm the Teeth, and to cloath the Bones of the Mandible about them, and with their heat to comfort them, and to them that want Teeth they doe afford the help of chawing; they have alſo a notable ſence by their Colligancy with the Brain, by means of the Nerves diſperſed through them; they endure paſſions of all ſorts.

Of Palatum, *the Palate.*

Palatum quod labiis dentibusque quasi palis munitum sit.

AFter the Gums, according to the true method of universal Anatomy, doth occur the Palate; which is a part of the mouth, witness *Aristotle, primo de Historiis, cap.* 11. and is that part of the mouth either open or shut which is above the tongue.

This part is bony, ordained of the bones of the upper Mandibles, nevertheless it is covered with some flesh, with its pannicle covering it, in which there are some Nervs giving the sense of Tasting, and this part in the mouth is resembled to the hollowness of the roof of a Vault, or to the covering of a Furnace, and therefore it it is called *Cælum*, and *Altum oris*, the higheſt part of the mouth; and it is called *Palatum, quia in apertione oris palam ostenditur*, because in the opening of the mouth it is shewed openly to us; or, *quia manifeste latum videtur*, because it seemeth manifestly broad; and the

the Palate, witneſs *Galen*, is as it were a bell lying before the *Laringa*, or *Epiglottis*, in which is made the ſounding of the Voyce, in which by the means of the Nerves is the notable Senſe of Taſting.

Its ſituation, its figure, its quantity, and number, and Colligancy appear; its complexion is cold, becauſe it is bony by predomination; in that member there is not any hole ſerving the Collatory, as ſome doe think, by which the ſuperfluities of the Brain ſhould bee purged out, but ſuch a hole or holes are in the bone *Baſilare*, above the Noſtrils, as ſhall be ſpoken in another place.

The helps of it are, that the mouth being ſhut, and alſo open, the Air might be retained there to this purpoſe, that it might warm it if it bee cold, leſt being ſo it might hurt the Heart in its entrance; it alſo retaineth Air, by which the Heart is refreſhed in neceſsities; it alſo helpeth in the retaining the Vocal air, and therefore the Palate is rugged for this,

that the air may goe forth full of surges; the Palate also by its hollowness helpeth the revolution of meat in the mouth in the time of chawing; by means of its hollownesse also the Tongue is moved more nimbly for its operations; it also helpeth digestion with its pellicle, the pellicle of the whole mouth helping it, and it may be the Spitle mixed with meats in chawing.

It suffereth Passions of all sorts, and among other Diseases it suffereth in Feavers the *Colam*, or *Alcolam*.

Of the Uvula, or *Uvea*.

Ex Uvæ similitudine.

IN the ending of the Palate about the Fauces, towards the head, right against the root of the Tongue is one member, fleshy, of a rare substance, covered with the membrane, whose quantity and shape is equalled to the grane of a Grape, and therefore it is called *Uva*, *Uvigena*, and *Uvigera*; it is also called *Columella*, and also

Colum-

Columna, and of some *Gargareon*, *Gargar*, and *Gurgulio*, it is also called *Fundibulum*; nevertheless this member encreaseth more than naturally in length and breadth, by humidity filling it, and sometimes it is like unto a Mouse tayl, as I have often seen; and sometimes it is indurated, and sometimes stranguleth, witnesse *Aristotle*.

Man only hath this member; its substance is spoken of, in which there are some Veins, and Arteries, and therefore if it receive solution it notably induceth bloud; its complexion is warm and moyst; its number, situation, and Colligancy appear; this member giveth way to things that are swallowed; neither hath it voluntary motion, therefore it is without muscles; it helpeth in the breaking and altering the air, and according to some in the tuning the Voyce; it also hindreth thirstinesse, by hindring air from entring the Fauces violently.

It suffereth Passions of all sorts,

and especially corrosion, and mollification, in which there is often required Cautery.

Of the Tongue.

Lingua ex lingo, qua parte lingimus.

THe Tongue is sometimes taken for the variety of Languages, as the *Greeks*, the *Arabians*, the *Latines*, and of that kind; it also signifieth many other things, but for the present it is taken for a member contained in the mouth, and it is called *Lingua à ligando*, of binding, because it is bound from one end to another within the lower Mandibles.

The substance of this member is naturally rare, fungous, and soft; it is also soft by accident, because of the Humidities descending from the Head, and from the Stomach to it; also the glandulous flesh in the root of it (in which there are fountains of Spitle) doth moysten it, by means of the Spitle; it hath also a multitude of Nerves, as well for the Sense of touching and taste, as for

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the motion; thoſe that give the taſte come from the third pair of the Nerves of the Brain, but thoſe that give the motion come from the ſeventh, and theſe Nerves are notable, becauſe the Tongue hath need of an excellent ſence, and alſo motion; it alſo needeth very much heat and nouriſhment, therefore it (and in like manner the Yard) hath more and greater pulſant and quiet Veins than any other member like to it in bigneſs; and the Nerves that give it motion are diſtinct from them that give it ſenſe, but thoſe which give the ſenſe of Feeling, doe alſo give Taſting, and the taſting is more eaſily corrupted than the feeling, becauſe the taſting is a more ſubtile vertue than the feeling; and the ſituation of the Nerves of ſenſe is ſuperficial, but the ſituation of the Nerves of motion is nearer the Center more or leſſe, according to the place of the muſcles, which are commonly appointed nine, to wit, four pair and one ſingle, with which it is moved

moved to every difference of position; and the Tongue in its root is large, grosse, and strong, but in the former part it is subtile and sharp, that it might be more fit for motion.

Of the aforesaid muscles two are on the sides of the Tongue, of both sides one, which are called Latitudinal, proceeding from the sharp bones of the Head, placed behind the Ears, from which place also in part doe come the Fibers of one muscle, which is common for the motion of the Lips, and for the motions of the Apples of the Face, and these bones are called *Sagittalia*, and *Acularia*; there are also two called Longitudinals, beginning from the upper part of the bone *Lambda*, which are continued with the middle of the Tongue; and there are two other muscles which move the Tongue overthwart, proceeding from that side which is the lower of the two sides of the bone *Lambda*, and those doe penetrate between the aforesaid Longitudinals,

dinals, and Latitudinals.

There are also two others converting it, and turning it upward, and the Fibers of them are spread abroad in breadth under the aforesaid, and these are continued with the bone of the lower Mandible; nevertheless *Avicen* 12. *animalium* saith, that those last are above the others; after that there is one muscle called single, which continueth the Tongue to the bone *Lambda*, and draweth the one to the other, and this muscle driveth the Tongue to the outward parts, by lengthening it, it also draweth back, and shortneth it.

Yet there are many that say, that the Tongue is not moved to the outward parts voluntarily, but meerly naturally from the imagination, as the Yard; and some say that it, and also the Yard are moved of muscles, and of the imagination together, and some of the imagination only, which by means of the spirit causeth a windinesse, dilating, and erecting the Yard,

Yard, and in like manner the Tongue, with bringing it out of the mouth; but these things are handled of *Galen*, *Primo de motibus liquidis*, and of *Avicen*, *Prima primi*, in the Chapter of the muscles of the Tongue, and there the Expositors doe resolve the doubts, which see.

* *Hyoides Latini cum Græcis appellant, idq; voce contractiore, siquidem* ὑψιλοειδὲς *dicendum esset, quod* ὑψιλον *literæ formam ex primat, vocatur* λαβδοειδὲς *sed quia ubi conjunctum est & sinum facit, non ita acuto angulo terminatur, rectius illud* υ *figuræ quam* λ *simile dicemus.* Columbus De ossib. l. 1.

Of the Bone of the Tongue.

THe Tongue in the root of it hath a bone to which it is knit and fastned, and standeth firm, as upon his *Basis* in his many motions; and this bone is quadrilateral, or four-sided, not very hard, but it is as it were Cartilagineous, and it is called *Os* Hyoideum*, and *Lambda*, or *Lambe*, because it is like to that Greek letter; two of the sides of it are towards the Tongue, which are in the form of the aforesaid Letter two forked, and two also so formed bigger than the first, are toward the Cartilage *Deltalis*, or Target Cartilage of the *Epiglottis*; which

which they embrace, and are faſtned to it, leſt it ſlide here and there, that this bone might the better make firm the other members faſtned to it; and it is not only faſtned to the *Epiglottis*, but alſo to the *Meri* by ſome Ligaments.

And this bone was not of a very long, or of a ſtraight Figure, becauſe the weightineſs of the Tongue had drawn it to one ſide only, and then there had not been good ſpeech, nor good chawing; and this bone is called *Hyoideum* of *Galen*, and *Os Lambda*, and of *Avicen* Alfahic.

The helps of this bone are of *Galen* ſet down many, although it bee a little bone; firſt, many muſcles doe come from it to the Tongue, and ſome muſcles alſo of the *Epiglottis*, and ſome doe goe from it to the *Spatula*, and ſome to the Breaſt, and ſome to the Mandibles; from that alſo, or from its Ligaments doe ariſe the Chords of the muſcles neer unto it, and it is alſo a defence of the Tar-

get

get Cartilage of the *Laringa*, and this bone is the principal foundation upon which the Tongue is turned in its motions.

This Bone hath three conjugations of muſcles proper unto it, to wit, one pair proceeding from the extremities of the lower Mandible, toward that part with which it is continued to the root of the Tongue, whereof the one is on the right, the other on the left, and that pair whilſt it is contracted draweth it toward the Mandible.

The ſecond pair ariſeth under the Chin, and paſſeth to that bone under the Tongue, and is faſtned to it toward the upper part, to wit, toward the *Epiglottis*, and that bone, this draweth to part of the Mandible.

The third pair ariſeth from the Needle-like additaments of the bone of the Head, to wit, from the two ſharp bony extremities, which are behind the Ears, and thoſe muſcles are continued with the end of that bone, which is toward

ward the Tongue, and they draw it to the upward parts backward.

All the other muſcles continued to this bone are common to it, and to the members to which they goe.

Under the Tongue it ſelf are two notable Veins, on either ſide one, which in many diſpoſitions are let bloud (eſpecially in the Synanche or Squincy) which are red, ſometimes black, and ſometimes green, and they are called of ſome *Ranina*.

Under the Tongue alſo where it is faſtned to the mouth, are certain notable Caves divided into two parts, which are called the Orifices, or Mouthes, or fountains of Spitle, which of *Avicen* are called *Generativa ſaliva*, the engenderers of Spitle, in which a ſtile or pin of a Table-book doth eaſily enter; theſe Orifices are opened and ſhut like a Purſe, as the Spitle encreaſeth and diminiſheth; theſe fountains are terminated to the aforeſaid kernelly fleſh placed

in

in the root of the Tongue, from which a ſpitly moyſture doth continually ſweat out into the aforeſaid fountains.

Under the Tongue alſo is a certain pellicle, in the middle of it reaching long-wayes, which is called of our Vulgars *Il filello*, which in ſome is great, and the Widwives or Chirurgions doe cut that in the age of infancy, which if it be not cut maketh them hard of ſpeech.

The complexion of the Tongue is hot and moyſt; its ſhape, and ſituation, and Colligancy doth appear from what hath been ſaid; its quantity is conſpicuous, for witneſſe *Ariſtotle*, one is broad, another narrow, another mean, but that is laudible which is meaſured in its Longitude aud Latitude, according to the ability of ſpeaking.

In number, although it may ſeem one member, yet there are two members, nevertheleſſe they appear one compounded of two likes; for commonly Nature hath crea-

created the Senſes double, that if hurt ſhould happen to one part, the other part might remain unhurt; and it was not divided ſenſibly into two parts diſtant from one another for the chawing and ſpeech, but it is united by means of one Pannicle covering it, nevertheleſſe this Pannicle is divided in length into two ſides, below and above, yet united and very firmly faſtned to the Tongue, and this Pannicle is continual with the pannicle covering the Stomach, and *Meri*, and the whole mouth within ſide.

The helps of the Tongue are principally for the diſtinction of Voyce, and for the joyning of Letters, and therefore *Galen* in his Book, *De voce & anhelitu* ſaid, there are three members appointed for the Voyce and Speech, to wit, the *Trachea*, the *Epiglottis*, and the *Tongue*, and every one hath glandules tempering it with moyſture.

And the glandules of the *Trachea* are in the Neck moyſtning it,

and making the parts of the Neck even.

And the glandules of the *Epiglottis* are those which are called *Arcæ aeris*, chests of air.

There is also a certain fat kernelly flesh about that, covering of the *Epiglottis*, which is called *Glotida*, which is a principal organ of the Voyce; but the Tongue hath glandules to which Veins doe passe, carrying Spitle to them, but the rest are without a Vein but are filled of their own accord with moysture flowing to and again unto them, and in the *Epiglottis* is engendred moysture, with which it is moystned: some moysture also floweth unto it from the Head.

The Tongue also helpeth for the discerning of taste, it also helpeth for the turning of meat in the mouth, so that every part of it may be bruised; it also helpeth swallowing; it suffereth passions of all sorts.

Of the Amigdals, or Almonds.

IN the upper part of the Tongue on the ſides about the root of it, are certain kernally or glandulous fleſhes, on either ſide one, called of many *Amigdalæ*, *Almonds*, which together with the aforeſaid *Uvea*, and *Galſamach*, and alſo *Aiſabic*, are placed of *Avicen* (9. *tertii*) among the parts added to the throat, and by the throat, the interpreter of *Avicen*, underſtandeth the ſpace in which are the paſſages of the meat, and of breathing (but not well) becauſe *Guttur*, the Throat, is taken of the Latines for the *Trachea arteria*, it is alſo taken for the former part of the Neck, which is from the Jaws to the *Jugulum*, and therefore *Celſus* ſaid that the Veins *Granges*, that is, *Guidez*, are in the right and left ſide about the *Guttur*, or Throat, and *Pliny* being witneſſe, the throat is ſo much in a man, as oftentimes ſwelleth up in a Diſeaſe, and this tumour is called *Botium*,

Ex Amygdalorum ſimilitudine

and alſo *Struma*, although *Struma* may alſo manifeſt *Scrophulaes*, and ſome other tumours.

Therefore that ſpace which is behind the *Uvea*, and the aforeſaid *Almonds*, and *Galſamach*, and *Alfahic*, is called *Faux*; and *Faux*, or *Guttur* in the rule of *Avicen*, 9 *Tertii*, is not any member, but is that vacuity to which the top of the *Gula* or *Meri* is terminated, in the termination of which toward the fore-part is the *Uvea*, and the *Almonds*, and *Alfahic*, and *Galſamach*; but in its upper termination is that hollowneſs which is terminated by above the Palate, to the Noſe, and to the bone *Baſilare*, towards the *Anfractus*, or turnings, being under the Colatory, of which, ſpeech ſhall be made hereafter.

And the aforeſaid *Glandules*, of which wee intend for the preſent, are commonly called *Tonſiles*, and *Celſus* calleth thoſe *Glandulaes*, and *Mundinus Fauces* (although not well) and the Greeks call them *Antiadas*, and *Parhitmia*.

The

The ſubſtance of theſe Almonds is fleſhy and ſinowy, to wit, with Pellicles, with which it is faſtned on the ſides coming from the root of the Tongue toward the Palate, and by means of them the aforeſaid *Amigdales* are united to the Palate, and thoſe Nervous pellicles, together with the *Glandules*, are as it were little hollow ears, and therefore they are called *Arca* a Cheſt, or the Storehouſe of Air, for thoſe Cheſts are notable in the Beaſts *Cynocephalis*, within which they keep not only air, but ſometimes (as I have ſeen) meat, as are Cheſtnuts, Chiches, Filberds, Beans, or the like, yet thoſe *Amigdales* with their pellicles may bee ſeen better in one than in another, but better in a living Creature, becauſe in a dead Creature they are drawn back, and thoſe Cheſts keep the air more in the going out than in the coming in, that all might not goe forth from the paſſage of the Heart, and the Creature periſh, and that in drownings in waters,

and in ſtinkes it might be refreſhed by the air retained.

And thoſe Pellicles only (according to ſome) are thoſe which *Avicen* calleth *Galſamac*, or *Golzama*, but in my judgement they are not but the aforenamed Cheſts, becauſe *Avicen* ſaith, that above the *Galſamac* is the *Alfahic*, to wit the bone *Lambda*; and this bone is annexed to the Tongue, and to the *Epiglottis* before, under thoſe Pellicles, and if thoſe Pellicles are *Golmaza*, or *Galſamac*, the writing of *Avicen* is corrupted, to wit, that which ſaith, And the *Alfahic* is above the *Galſamac*, neither is there any other member there toward the Palate unleſs the *Uvea*, and the pellicles of the *Glandules* (of which ſpeech hath paſt) which make an arch for the retaining of air, and therefore *Galſamac* is not there, (but in my judgement) *Galſamac* is the *Epiglottida*, to wit, that pellicular covering which ſhutteth the *Epiglottis*, leſt meats and other extraneal matters might enter into it, as wee ſhall ſpeak anon. From

From that which hath been ſaid, the helps of the *Amigdales* do lye open; their Colligancy, alſo ſhape, quantity, and number doe appear; their ſituation is beſt ſeen when the tongue is depreſt, and the mouth opened in the furtheſt part of it; their complexion is hot and moyſt.

They ſuffer paſſions of all ſorts, and now adaies they are Apoſtumated, indurated, and ulcerated in a certain Endimious diſeaſe, which of the Vulgar is called *Morbus Gallicus*; and they doe eaſily receive Rhumes from the Head, and in them is cauſed the falſe *Squinantia*, or *Synancke*, which is called *Branconcellus*, and therefore it is ſaid,

Ad fauces Branchus, ad nares
Coriza catarrus:
If the Catarre doth come unto
the Jawes,
'Tis Branchus cald; Coriza to
the Noſe.

It is alſo called *Dragonzellus*,

and perhaps corruptly, and at *Bononia Strangegioni*, because they are apt to straingle, they are also called *Gaioni*.

You shall see those *Amigdales*, and also the Tongue better, the Mandibles being excoriated in that manner, as shall bee spoken hereafter, because I will place the Anatomy of their Muscles, and of the members of the whole Face, and also of the whole cane of the Lungs, that they may bee seen as the Workman list, because they are seldome shewn in a common dissection.

Of the lower Mandibles, or Jawes.

Mandibula ex mandendo, virt. officii.

THe *Amigdales* being seen, it seems good to me to determine of the two lower Mandibles, that the rest of the Neck may bee more fitly and diligently Anatomized; of the upper it shall be spoken in their place, and the Mandibles are taken of me for the present for those bones of the

Head

Head in which the Teeth are infixed.

And first it is to bee noted, the skin covering their Muscles, which in men is commonly full of hairs; after which are their proper muscles, serving to three motions, to wit, to the motion of opening the mouth, and to the motion of shutting it, and to the motion of chawing and grinding; the motion opening maketh the lower Mandibles to descend, and shutting elevateth them; and the grinding motion maketh them turn about, and decline to two parts; it is therefore necessary that the motion of shutting should be by muscles which descend from above, and draw to the upper parts; and the motion of opening is made on the contrary manner, and that of grinding with transversion.

The Muscles shutting are two, great ones, and having great Chords, which are called the muscles of the Temples, because they are fastned to the Temples be-

tween

tween the *Craneum*, and the *Ossa Paris*, and in a man they are small. leſt they ſhould burden the Head, and alſo becauſe a man chaweth things not very hard, and thoſe muſcles have great Chords, terminated to the lower extremity of the Mandibles, and they are very ſoft becauſe they are neer the Brain, from which they have three Nerves, two from the third pair, and one from the fourth, and by conſequence the ſolution of them is very bad; and therefore *Galen*, 11 *De Utili. cap.* 3. ſaith, If therefore as *Hippocrates* ſaid, thoſe parts which are near, and common, and prime, are moſt of all maligned, but there is not any nearer than the Temporal muſcles, neither doth any other muſcle communicate more with the Brain by more Nerves; it is good reaſon to hearken out the beginning of their paſsions; and for their nobility, Nature hath placed them in the hollowneſs of the Temples between the bones, keeping them on every ſide; the

muſcles

uſcles of the Eyes are alſo very
ble, becauſe they are near to the
ain, but they have not ſo many
erves as the other, and thoſe
o Temporal muſcles are holpen
two other muſcles, which doe
e unto the aforeſaid Mandibles,
the inner part of the Cheek,
d the Chords of thoſe Tempo-
muſcles doe not ariſe from the
d of the muſcle, but from the
iddle of it, that they may bee
onger.

But the muſcles opening doe a-
e from a place called in Arabick
lhiliricti, which are two bones
lled *Acuta*, *Acularia*, and *Sagit-*
ntia, added to the hinder part
the Head, and thoſe bones are
hind the Ears, and theſe two
uſcles deſcending are united, and
e made one muſcle, afterwards
ey are ſeparated, and of them is
ade a Chord that they may bee
ong; after that they are again
anched, and are filled with fleſh,
d the muſcle is made; after that
meeteth with the reflection of the
landibles, and when it is contrac-

ted

ted it draweth the Mandib
backward; and because the Man
dibles are heavie, descending e
themselves, two muscles only do
suffice them.

But the chawing muscles ar
two, on either side one, which ar
triangular, and very sinowy unde
the balls, and they are such that i
the contracting they might hav
diverse motions, so that by ther
the grinding and chawing migh
be compleat, and those muscle
with one of their *Basis* are abou
the *Ossa Paris*, and with one othe
toward the balls of the Face, an
with another toward the Mandi
bles; yet every angle of the afore
said muscles is most firmly mixe
with a part of the Face in the di
rect of them, that they migh
move the Mandibles diversly, an
some would have it (witness *Ga
len*) that every one of those mus
cles should be three muscles, an
that gibbosity which is in the ball
of the Face, is of those muscles i
part.

The Tongue also, besid
thos

ose muscles helpeth the chawing
turning about the meat.

And the muscles lifting up the
andibles are great, because they
ve a great motion, and they
soft, because they are next to
Brain.

And the muscles depressing are
all, because it is more easie to
press the Mandible than to ele-
te it, and to hold it being ele-
ted.

But the chawing muscles are
ean, because the circumduction
turning about of the Mandibles
more easie than the elevation,
d more hard than the depres-
on.

Some will wonder that Nature
ade the Teeth of chawing grea-
, and more than they of inci-
ng; it is to be said, that Nature
th prepared not only teeth to
t the meat, but she hath ordai-
d Reason and Art, which shee
eth for the cutting of meats;
ee hath also made the chawers
eater, and more, because the
awing action is stronger, and

more

more permanent; which chawing Art doeth not for the most part (unless by accident in sick people) as shee doth the cutting of meats.

The muscles being seen, that you may the better see the *Os Lambdæ*, and the head of the *Meri*, and the *Epiglottis*, you shall cut the skin transversly from either corner of that Fissure which is called the Mouth, and the aforesaid muscles toward the Ears, in which Section consider (if you can) the aforesaid muscles, and also the other parts of the Face, excepting the Nose, the Eye-lids, the Eyes, and the Ears, fleaing the skin with diligence from them which being seen you shall lay bare the bones of the lower Mandibles from their upper juncture unto the middle of the chin, in which they are firmly united by one juncture; the aforesaid bones are also united on both sides to the Head, by one loose juncture about the ears; you shall also note their Situation, Number, Figure,

Colli-

Colligancy, and quantity; their ubſtance, complexion, and helps ye open, they endure paſſions of all ſorts.

Of the Anatomy of the Throat, and of the Gula.

THe Mandibles being ſeen, remove them with diligence with a crooked Knife, Saw, or other Inſtrument, wholly from their place, that you may the better ſee the Throat, and the *Gula*, yet keep the Tongue unhurt, and the bone *Lambda*, that you may ſee the Colligancy of theſe members; the Mandibles being removed, obſerve the ſituation of the Throat, and of the *Gula*, and of the bone *Lambda*, which is placed near unto the root of the tongue, and the top of the throat; howbeit you may not ſtirre theſe members, unleſs you ſhall firſt ſee the muſcles of them; but before you may ſee them you muſt give way to the Anatomy of the Throat, and of the *Gula*, for thoſe members

Guttur a gutta, quia voces ſunt quaſi gutta fluentes ſermonis.

members are so fastned to one another by Pannicles, and Ligaments, that one cannot be shewed without the other.

The Throat depending under the Jawes even unto the Lungs, possesseth the formost situation; first, that by its hardness it might be a defence to the *Gula*; Secondly, because by that situation it is more direct to the Lungs, and so doth serve it better, and more easily; Thirdly, it is formost, because the *Gula* is longer than it, which if it should bee before the throat, it should either bee obliqued from the end of the Throat unto the Stomack, and the swallowing had been ill; or because there should also have been some inconvenient hollowness from the end of the Throat unto the Stomack, toward the back.

And the Throat is a body very long, round, hollow as a Cane, whose substance is compounded of many annular Cartilages, yet they are imperfect circles, like those Bracelets called *Armilla*, and they

are

are like the letter **C.** and therefore they are called *Cartilagines C formes*, *C* like Cartilages, and *Semicirculares*, but they are bigger than a half circle, and in the part not Circular they doe meet with the *Gula*, by means of a ſoft pannicle and ſomewhat hard, being perfectly Sphærical, covering and faſtning them within and without, and beyond the pannicle, on the inſide covering the throat from the top to the bottom; there are other Ligaments filling the throat toward the *Gula*, where the Cartilages are uncompleat, nevertheleſs thoſe Cartilages without the pannicle are properly the inſtrument of voyce.

The upper part of the throat is commonly called *Epiglottis*, *Laringa*, and *Nodus Gutturis*, and ſometimes *Gurgulio*, and it is called *Caput Bronchii & Gutturis*, but the reſt of it is often called an Artery, and a Spiritual Organ, or Pipe, and the Vocal Artery, and the ſharp Artery, and the cane of the Lungs, and it is called *Farin-*

ga à findendis vocibus, of cleaving of Voyces, or of *Fando*, of ſpeaking, and *Gargar*, and *Gargareon*, but *Laringa* for the moſt part by the interpreter of the Books of *Galen*, *De utilitate partium*, in the Latine tongue; *Laringa* is taken for the upper part of it, but the lower part is commonly called *Trachea*, and *Guttur*, called ſo, a *Garriendo* of chattering, becauſe that chattering cometh from thence; and *Avicen*, *Prima primi capitis*, *de muſculis gutturis*, underſtandeth by *Guttur* this member, but *Nona tertii*, by *Guttur* he underſtandeth that ſpace which is behind the *Palate*, in which is the paſſage of meat, and of breath, which of the Latines is called *Faux* or *Fauces*.

This member is alſo called *Bronchium*, or *Bronchum*, for the likeneſs of a certain Fiſh, and alſo of an Earth-worm called *Bronchium*, whoſe body is long, Cartilagineous, or ſcaly and annular, as is a Viper.

The lowermoſt part of this member

member is divided into two parts, one on the right, another on the left, which entereth into the upper part of the Lungs, and from hence it is divided into infinite Fibers unto it all, growing alwayes leſſe through the whole ſubſtance of the Lungs, through the center of it to the extreams, carrying and re-carrying ſpirit to the Heart, in that manner which it appeared in the demonſtration of the Lungs.

This member is not of one Cartilage only, but of many, convex without, and hollow within, united one near another, at a certain diſtance by Ligaments, and Pannicles; that by meanes of the Fibers of the Pannicles which are longitudinal, and the Nerves of their Muſcles, it might bee extended and drawn back in its motions; and it is moderately hard and light, that it might bee ſhrill; and it is deprived of ſence, that it might reſiſt outward things hurting it; and it is round, becauſe it is leſſe apt to bee hurt; and their

Cartilages toward the *Gula* are incompleat, that by their hardneſs they might reſiſt things ſwallowed, therefore the chanel of the *Trachea* is filled behind of the aforeſaid Pannicles and Ligaments, which by their ſoftneſſe doe give way to things ſwallowed, and for this cauſe the hollowneſſe of the throat within it (its pannicles giving way) ſerveth the *Gula* in neceſſities, when great morſels are ſwallowed, and the pannicles of the throat doe eaſily obey in ſwallowings, becauſe the time of breathing and of ſwallowing is diverſe, and not only the throat in this ſerveth the *Gula*, but alſo the *Gula* the throat in breathing, becauſe in the time of breathing the *Gula* is empty, as the throat is empty of breath in the time of ſwallowing, becauſe the *Epiglottis* is always ſhut in ſwallowings.

Alſo the hinder part of the throat was not Cartilagineous, but pannicular, that it might bee the more eaſily moyſtned by drinking, or by licking with the tongue

tongue ſome moyſt thing, as it often happeth in great heats and in Feavers, and that alſo matters contained in the Breaſt might bee more eaſily brought out by hawkings, as it is in the Pluriſie.

And this member was wiſely mixt, Cartilagineous, and Pellicular, for two reaſons, to wit, for the ſound or voyce, and for breathing, and it doth therefore ſerve it, and the Voyce, and it is not ſhrill toward the *Gula*, becauſe there it is ſoft, and as it were fleſhy, and therefore if the *Trachea* and *Epiglottis* bee not decently dry, but moyſt, there is hoarſneſſe, witneſs *Galen*, in his Book *De voce & anhelitu*, as it is before drink and liquid meat, that the Voyce is clear and ſhrill, but drink being taken by the *Gula* moyſtning the *Trachea* next, and united to it, a clear voyce is not uttered, and if it be ſuperfluouſly moyſtned with drink or rheum there is cauſed hoarſneſs, and therefore old men by reaſon of the moyſture of theſe parts are hoarſe, and dry bodies

have a more clear and ſhrill voyce than moyſt; and if the inſtruments of the paſſages of the Voyce be opened, then ſuddenly much air goeth out, and that is *Anhelitus*, the breathing; and if they bee conſtrained, with the breathing there is ſomewhat to bee heard differing, by the difference of the inſtrument conſtrained; and if the *Epiglottis* bee conſtrained a voyce is made; but if the cane only, there is made a certain ſound which is between breathing, and voyce, and this is *Raucedo* hoarſneſs, of theſe things ſpeaketh *Galen*.

From that which hath been ſaid, the ſubſtance of the throat doth appear, whoſe lower pannicle is ſolid and hard enough, that it might reſiſt Catharres, and evil Hawkings, and the ſmoakie vapour breathed from the Heart, and that it may withſtand the motions of the throat in the voyce; the ſituation, figure, and Colligancy, and number; and helps of the throat, and its quantity are

to

to be seen; its complexion is cold and dry; it suffereth passions of all sorts.

Of the top of the Throat which is called Epiglottis.

THe aforesaid things being seen, I come to the top of the Throat, the principal substance of this member is of many Cartilages joyned together artificially, and with great diligence, from which the Voyce, and conservation of life reboundeth; the Muscles, Ligaments, and Pannicles covering the whole *Trachea*, doe bind together these Cartilages within and without.

ἐπιγλοττὶς *quod lingulæ superemineat quæ* γλοττὶς *dicitur Columb.*

This member (witness *Galen*) is not of one only Cartilage, but of many, unlike in shape and quantity, that by the benefit of the number it might bee dilated and constrained for the breathing and voyce; and its Cartilages are at least four, whereof one is not a pure Cartilage, therefore Authors doe commonly appoint three Car-

tilages in the *Epiglottis*, which are pure; the first pure Cartilage is called *Peltalis*, or *Scutalis*, or *Scutiformis*, because it beareth the form of a Buckler, the convex part of it is forward, but the concave is turned to the center of the *Epiglottis*, that is, to the passage of air, and this is bigger than the rest, which of us seemeth notably eminent in the former part of the Neck under the skin.

After the *Scutalis*, toward the *Gula*, or *Meri*, is the second pure Cartilage, which wanteth a name, neither hath it a name of the Greeks, nor of the Latines, and therefore it is called *Cartilago innominata*, or the Chartilage without name; this second hath its lower part of a perfect circle, with which it is united with the upper circle of the *Trachea Arteria*, behind, before, and on the sides, and toward the fore-part it is firmly united with its circular part under the *Scutalis*, and the *Scutalis* hath two notable additions, with which it doth embrace the second, and

those

those two united together doe compound the whole circular pore of air before, behind, and on the sides, being altogether cartilaginous and hard.

The third Cartilage being also pure, is commonly called *Cymbalaris*, and of *Galen* is called *Antyoidea*, because it is fastned within the second Cartilage in the top of it, toward the pore of air, right against the bone *Hyoidea*; this third is so much less than the second, as the first is greater than the second, and this Cartilage (in my judgement) is not one only, but two, united so that they seem one only, and this in its opening taketh the course of the two shuttings of a little Book, one whereof is shut against the other, and they work in a contrary manner in the opening of them, and this Cartilage when it is shut in its upper part, and also in its lower, maketh the hole wider than in the middle of it, and then it hath such a hole, or holes, as the trumpet hath in its ends, but greater above than below;

low; therefore *Galen* said in his eighth Book, *De juvamentis*, that for the voyce it behoved the *Epiglottis* to be first broad, afterward narrow, and after that again to be made broad; and when this is shut it meeteth with the *Scutalis*, and when the parts of it, or the sides are opened, they goe toward the Cartilage that hath not a name.

Above these three Cartilages is a fourth, which is a body membranous, cartilagineous, and fat, being like to the tongues of Pipes, and therefore *Galen* calleth it *Glotida*, it is also called *Sublinguium*, and this is the most principal Organ of Voyce; and the *Glotida* is not a member of pure Cartilage, because a hard thing is hardly doubled, neither of pure Membrane, because in shutting it would be doubled, but it is compounded of Membrane and Cartilage for its decent shutting; and in it there is also fat, lest it should be dried as well by the almost continual motion, as also by the breathing and respiration of the air dry-

drying it; this member hath the *Epiglottis* to shut in time of swallowing, and the *Cymbalaris* also shutteth it; this on the hinder part, but the *Glotida* before, so that ordinarily neither in Vomitings, nor in swallowings, any thing can enter into the cane of the Lungs.

And the *Epiglottis* is not of one only Cartilage, but of many, that it might bee dilated and constrained in the diversities of formings of the Voyces, and therefore Nature gave to those Cartilages, and also to the Throat muscles serving them, four whereof doe unite the first Cartilage to the second, and two of them are within, shutting the *Epiglottis*, and two without.

There are other four which joyn the second with the third, to wit, with the *Cymbalaris*, two whereof are behind, and those open, drawing the *Cymbalaris* to the hinder parts, and two on the sides, drawing that also to the sides.

There

There are two other muſcles about the Cartilage *Scutalis*, within the *Epiglottis*, which ſhut the *Cymbalaris*.

There are alſo two other Muſcles within the *Epiglottis*, about the root of the *Cymbalaris*, alſo ſhutting the *Epiglottis*; and thoſe twelve are proper to the Cartilages of the *Epiglottis*, joyned to none of the adjacent parts, witneſs *Galen*, 7. *De utilitate.*

The *Glotida* alſo hath one pair of Muſcles, by means of which it ſhutteth the top of the *Epiglottis*, and thoſe are ſtronger than the reſt, witneſs *Galen*, 8. *De juvamentis*, and thoſe reſiſt the muſcles of the Breaſt, and other muſcles opening the *Epiglottis*, and perhaps (according to ſome) that thoſe are the two laſt immediatly deſcribed.

Beyond the aforeſaid are alſo eight other Muſcles, whereof two are proper to the cane of the Lungs, witneſs *Galen* in his Book *De voce & anhelitu*, and thoſe are in the channel of the throat,

and

and *Avicen* saith those are at the *Gula*.

There is another pair of Muscles serving the Throat, yet not principally, but serving also to the members by, and this pair continueth the third Cartilage with the *Gula*.

And there are two other, serving the Throat, at the ruine of which there is caused hoarsness, and in that manner there will bee twenty muscles serving to the *Epiglottis* and the Throat.

And from hence is comprehended the error of some Moderns, which doe beleeve that in the *Fauces* there are two proper muscles serving to them, thinking that *Avicen*, in *Primo primi de musculis gutturis*, should by *Guttur* understand the *Fauces*, as he did in *Nona tertii*, but wee deny this; because that *Faux* is not any determinate member, as wee have spoke more largely in our Commentaries upon *Mundinus*, and therefore those that intend to judge rightly, doe not trust in names,

names, because the Interpreters of the *Greek*, and of the *Arabick* into Latine (being often ignorant) doe take one thing for another, and by that means almost all Sciences are spurious by the variety of Interpreters.

Of the Gula.

Gula ex γεύομαι Gusto.

AFter the Throat is to bee shewed the *Gula*, which holdeth the hinder part to the Throat before the *Spine*; this descendeth unto the Stomack from the *Fauces* by the Neck and Breast, being contiguous to the Artery *Aorta*, and to the *Spina*, perforating the Midriff; this some Latines doe call *Gula*, the Servant or Steward of Meats; the *Arabians* Meri, the *Greeks* call it ὀισοφάγος, as it were *Ferens comesta*, carrying things that are eaten.

ab ὀίω *fero*; & φάγω *Edo.*

This member being included descendeth directly unto the fourth Spondile of the Breast, afterward it is a little obliqued to the right side, giving place to the *Aorta* descen-

descending, lest the motions of the *Aorta* should hinder things swallowed, and when it is not much distant from the Midriff it is a little lifted up, lest it should compress the Vein *Chilis*, and that it might be the better fastned for the sustaining of the aforesaid descending Nerves, after that about the tenth Spondile it doth again begin to bee obliqued to the left side, and so descendeth obliqued to the Ventricle.

The substance of this member is fleshy and pellicular, having in the inner Pannicle long Fibers serving for attraction, terminated at the skin of the mouth, and of the lips, and broad ones in the outer part serving for expulsion, helping the expulsion to the lower, and also to the upper part, by contracting themselves, and by that means the Long and the Broad Fibers doe help the swallowing, they also help Vomiting, and two Nerves doe cleave to the *Gula*, descending from the Brain, on either side one, from which the Reversives doe arise. And

And the inner Pannicle of the *Gula* is thicker in the top of it than in the bottom, and thicker there than in the Stomack, and thicker in the Stomack than in the first Inteſtine, becauſe there is not required a reſiſtance equally ſtrong in touching of the matter digeſted, as of the undigeſted; and this inward Pannicle is continued to the mouth, that the attraction of meats might bee continual, by which means the *Epiglottis* aſcendeth naturally in ſwallowings, being drawn of the Fibers of the *Meri*, or *Gula*, by reaſon of the ſtrong Colligancy of them together; and from hence it is comprehended, that the *Meri* is a part of the Stomack continued to it with gradation.

The *Epiglottis* alſo aſcendeth, witneſs *Galen* in his Book, *De Voce & Anhelitu*, becauſe in all the inward part of the throat is that Pannicle involving, being faſtned even unto the extremity of the mouth and lips, in which alſo there are long Fibers, drawing the

Epi-

Epiglottis to the upper parts.

And there are ſome which ſay, that the *Epiglottis* doth alſo aſcend voluntarily, becauſe it aſcendeth when we will, and by that means it will have its motion compounded of a voluntary motion, and a natural; but *Galen* thinketh otherwiſe in his Book *De motibus liquidis*, holding that the *Epiglottis* doth only aſcend naturally, in whoſe aſcenſion the muſcles of the *Glotida* doe neceſſarily draw it to the lower parts; and it may bee thoſe Muſcles are not moved voluntarily, becauſe the *Epiglottis* in his aſcent being drawn by the aforeſaid Fibers, doth draw the *Glotida* with it as other Cartilages; in whoſe aſcent the *Glotida* is neceſſarily depreſt, becauſe it is faſtned to its proper Muſcles, which are united with their lower part toward the *Trachea*, and with their upper to the *Glotida* it ſelf, which doe not aſcend with the *Glotida*, and therefore doe draw it downward, and by that means alſo (not alwayes

voluntarily is the *Glotida* shut in swallowing, by the ascension of the *Epiglottis* in the aforesaid manner, whereby it cometh to pass, that things drank and swallowed pass not to the *Guttur*, unless in a time in which the swallowing doth hasten before the ascension of the *Epiglottis* be perfected, and then Nature expelleth the things entred into the Cane with a Cough if it can; for it is reported in the History, that there hapned choaking to *Fabius* the Prætor, and to *Anacreon* the Poet; to this, with the stone of a Raison, to the other with a Hair swallowed in Milk; yet the *Glotida* is shut voluntarily by its Muscles, when we will retain inspiration and respiration; and in that manner the aforesaid Muscles of the *Glotida* doe shut it, sometimes by themselves, and sometimes by accident.

Plin. lib. 7. c. 7

The shape of the *Gula* is very long, dilated in the upper part in the *Fauces* like a trumpet; and it is not like a Cane, for it is like a Gut, whose lower Orifice is continual

tinual to the Stomack, where it hath notable ſence by reaſon of notable branches of Nerves from the Brain terminated at it; its quantity appeareth; in number it is one member; it is faſtned to the mouth, and to the *Epiglottis* moſt firmly, ſo that one is hardly ſeparated from the other, it is alſo faſtned to the Throat throughout, to the Heart by Arteries, to the Liver by Veins, and to the Brain by the aforeſaid Nerves; its complexion tendeth to hot, but not excelling, becauſe it is very pannicular; its helps are to carry things ſwallowed to the Stomack, and to bring back many ſuperfluous things from it, to without the mouth; it ſuffereth paſſions of all ſorts.

He that deſireth with diligence to have the demonſtration of the Throat, and *Gula*, firſt let him ſee the ſituation of them, beginning from the loweſt part, noting the *Gula*, and as he goes upward let him note the Colligancy of it with the Throat, ſeparating them

with a *Falx*, or other device, near unto the *Epiglottis*, noting the aforesaid Muscles, to some of which hee shall see the Reversive Nerves to be fastned.

The Muscles being seen, let him separate the *Gula* in the top of it from the *Epiglottis*, and let him note its Cartilages, noting also the situation of the bone *Lambda*, which with its two greater additaments embraceth the Cartilage *Scutalis*, and with its lesser sustaineth the Tongue; after that the three aforesaid Cartilages of the *Epiglottis* may be seen, and the fourth Cartilage united with fatness, and pellicle, called *Glotida*, by means of which is made the shutting of the *Epiglottis*; afterwards let the Tongue be cut, noting its aforesaid parts; and these things suffice for the Anatomy of the middle Belly, in which I have been prolixe, and not absurdly, because these things are delivered to learners.

Of

Of the Anatomy of the upper Belly.

THe upper Belly is named *Caput* the Head, *Quia ibi ſenſus initium capiunt*, becauſe the Senſes take their beginning there, which the Greeks call κεφαλὴ, and the Head for the preſent is taken for all that which is ſuſtained by the Neck, in which the Animal members are contained, that is, the Brain; of the former part of which there is demonſtration made of ſome parts, for the better orders ſake.

κεφαλὴ *Grecis dict*: ἀπὸ τῦ κεκυφῶδαι *cavitate*, *Bauhin.*

This Belly in a man is notable for its contents, and it hath parts common and proper; of the common ſome is before, ſome behind, and ſome on the ſides; ſome above, ſome beneath; the former part is called *Sinciput*, the hinder part *Occiput*, the lateral *Tempora*, the Temples, and the place of the Ears; and the upper part is called *Interciput*, *Vertex*, and *Cacumen*, but the lower is called *Baſis capitis*,

the *Basis* of the Head, and of its members, whether the Head bee for the Brain, or for the Eyes, we have spoken in another place.

The parts proper, some are containing, and some contained; the containing are all the outward parts, to wit, first the Hairs, which nevertheless are not to bee numbred in the parts of the Head, (unless unproperly) because they are not members, but they are reckoned as a superfluity, sometimes profitable.

Secondly, is the Skin, which is gross, somewhat fleshy, that the Hairs might bee well fastned in it, and that it might be a defence to the parts below it.

Under the skin is a little flesh, or none, except in the Fore-head, and in the Temples.

After the Skin and Flesh is a Pannicle compassing the whole bone of the Head, called in Greek περικρανέον, and in Arabick *Almocatim*, and of some *Zinzia mater*.

After the *Pericranium* follow-

eth

eth the bone of the Head, called of the Latines *Calva*, and *Testa*, and in Greek *Craneum*, or κρανίον, because it is hard.

κρανίον ut κράνειον *cor-neum*

The things contained are the hard Pannicle, and the soft Pannicle; this is called *Pia mater*, and *Secundina*, but that is called *Dura mater*; and above the mouth, in the bottom of the Head, below the hard Pannicle, manifold use doth place the *Rete mirabile*.

Licophro-ni autem παρατὸ κράνειν *ab imperando.*

Within the aforesaid Pannicles is the medullous substance of the Brain, with its Ventricles, *Glandules*, Worms, and Nerves risen from the Brain, yet the *Pia Mater*, and the *Dura*, are of some placed among the parts containing, but the Nose, and the *Miringa* of the Ears in like manner, and the Eyes also are placed among the parts of the Head contained, but not in the upper Belly, nevertheless they are contained in the Head, and so the whole Face is contained in it also.

Therefore the Hairs are first to bee examined, which are engen-

dred by reason of the vaporous matter raised up from the whole to the Head, as it were overflowing by reason of the heat of the whole body, and from hence are made the hairs of the Head called *Capilli*, made for their end, because they are for comliness, as it pleaseth some, and that it might defend the Head from many outward things.

The Skin of the Head appeareth of it self, this wanteth motion unless in the Fore-head, and the Temples, & it is therefore deprived of Muscles; it hath also little sense.

You shall (by excoriating the whole skin from the Head) see the Pannicle called *Pericraneum*, every way made involving the Head, that the *Dura Mater* might be hung up in the *Craneum* by commissures, and by many other pores of the *Craneum*; this Pannicle is also there, lest the Skull should meet with the Skin, and the flesh of the Head without a *medium*, and that the *Craneum* by means of it might be sensible, and

that

that there might inhere to this Pannicle Veins and Arteries, feeding the Head on the outside, and those which enter in by the Commissures and other Pores, and those which goe out.

After that Pannicle is the Bone called *Cranium*, which lay bare throughout, considering the form of it, which ought to bee round, that it might be of the greater capacity, and less apt to be hurt, and it is lightly compressed on the sides, making the Prow of a ship before, and the Poope behind, that its Ventricles might bee long, serving the better to the operations of the understanding, and every form erring from that is evil, and by how much the more it is differing from that, it is the worse; this bone is not one continual, nor hard and thick as are many other, but thin and spongious, not very gross, and compounded with some Commissures or Junctures.

Nevertheless the joynts of it are not knobby, but with teeth like

like Sawes, and rough, because they are not moved, and the Skull is so that its junctures might bee stronger, and that if hurt should happen to one part, the other might remain unhurt, and also that the vertue of a Medicine to be applied to the Head, for an offence of the Brain, might the better work its effect; and that the vapours raised up from the whole, and from the Brain, might the more easily goe forth and bee resolved; and therefore the upper part of it is thinner than any other part, neither is it very hard there, because hurt doth not happen to the top, as to other parts (yet fiery *Mars* hurteth every place) and it is such lest it should burthen the body, but it is thicker in the fore-head, because it is soft there; nevertheless it hath two tables, within which there is a notable hollowness, lest it should burthen the body, and that between them there might be air implanted receiving the savours; and this part is softer than the rest, because

that

that which it containeth is ſofter.

But the Bone behind is harder, becauſe that which is contained behind is harder; alſo the Bone behind is harder, becauſe the eyes cannot defend it with their ſight, yet it is thicker and harder in the ſides, that it might bee ſhrill, becauſe there within the ſubſtance of it the Organ of Hearing ought to bee placed.

Alſo part of this bone in the hinder part toward the Neck is thick, groſs, compact, and hard, and alſo on the ſides behind the Ears, becauſe there are faſtned ſtrong Chords of the Neck, which have great and almoſt continual motions; and behind the Ear are certain ſharp eminences called *Clavales*, and *Aculares*, being very hard, to which many Muſcles are faſtned, moving the members of the mouth, and of the face, and of the neck, which if they had been ſoft ſhould not reſiſt the aforeſaid motions.

And this Bone is alſo hard about

bout the Temples, becauſe there are great Muſcles moving the Mandibles, and therefore all thoſe bones on the ſides toward the hinder part are hard as a rock, and are called *Petroſa*.

Alſo the lower part of this *Cranenm* called *Os Baſilare* is hard, chiefly in the direct of the Palate, where the Optick Nerves are ſituated in the form of a Croſs, through which (perforated in that place like a Sieve) the moyſt watery ſuperfluity of the Brain deſcendeth, and this place is commonly called *Collatorium*.

This Bone *Baſilare* in the top of it is not ſmooth but unequal, which may beſt be ſeen in Church-yards, as alſo other parts of the Head, and likewiſe all the bones of the Body, to the ſeeing of which let not him have recourſe, which is not a lawful Phyſician.

The number of the Bones of the whole Head, and the names of their Commiſſures I have very well ſpoken of in my Commentaries upon *Mundinus*, therefore I

let

let pass the declaring of many things for brevities sake, especially because the Writers of them doe not agree.

Part of this Bone hapning first, is that in which are the places of the Eyes called *Frons* the Forehead, which is terminated in the first Saw-like juncture meeting it, which is called *Coronalis*, because (as it pleaseth some) Kings are crowned in that place, or perhaps because this Commissure beareth as it were a Bow-like, or Circular and Coronal form, descending from the top of the Head, of both sides, unto the corners of the places of the eyes, which are toward the ears.

Right against this Bone is one other Bone terminated in the Saw-like juncture, placed in the hinder part of the Head, which is called *Commissura Lambdæ*, because it is like to that Greek Letter which is called *Lambda*; this Commissure hath also the form of a Bow.

Between these Junctures is another

ther Commiſſure alſo like a Saw, placed in the top of the Head reaching from before backward, and this is called *Sagittalis*, becauſe it goeth ſtrait from every of the aforeſaid Bow-like junctures to the other, as an Arrow ſtandeth to a Bow.

At the ſides of this Bone above the two *Oſſa paria* in the walls of the Temples, are two rough Junctures, on either ſide one, the lower bones of which doe ride over the upper bones.

The firſt three Junctures are called true penetrating within by a direct line, and thoſe laſt penetrating obliquely are called falſe.

Between thoſe lateral Commiſſures aſcending toward the *Sagittalis*, there is alſo on both ſides, one other rough Juncture which is ſeldom ſeen, unleſs in heads macerated a good while, or boyled to the uttermoſt, between which and the *Sagittalis* are two bones, on either ſide one, thinner than the other bones of the Head, which

which *Galen* calleth *Ossa Bregmatis*, and *Avicen Prima primi* calleth it *Craneum*, that place where the Coronal juncture is joyned with the *Sagittalis*, is called of some *Bregma*, and *Zuendech*, and *Fontanella capitis*, in which the bone groweth together in Children at the last; and there are applied Cauteries, and *Cerates*, and other local Medicines for Catarrs, and many other Diseases; in other parts of the Head also are many other Junctures, of which speech is not made, because Physicians have not so much regard of them as of the aforesaid.

From that which hath been said hath appeared the situation, substance, and shape of the Head; its quantity lyeth open, its helps and Colligancy are in part, and shall be spoken of; in number it is one; the number of the parts is spoken of, and also of the Commissures of the *Craneum*, whereof three are like Saws, penetrating directly inward, the rest are like Scales, penetrating obliquely.

Its

Its complexion is the complexion of the parts compounding it; it suffereth passions of all sorts, which if they be in the coverings, and in the Brain it self are judged ill, more or less, according to the place and quality of the Disease.

Of the Dura Mater.

Meninx dicta, ex rotunditate, à μήνη luna.

THe aforesaid parts being seen, (that the parts contained within the Skull may bee more fitly seen) divide the Head from the Neck about the third Spondile; after that cut the Skull a little above the Ears (unto the inward circumference of it round about, so that you may not hurt the *Dura Mater*) keeping always the aforesaid situation.

This being done, lift up the whole upper bone cut from its lower part with some Elevatory fit and strong, because it is most firmly fastned to the *Dura Mater* on every side, as well in the Commissures as in many other pores of it.

The

The Skull being lifted up, you shall see the *Dura Mater*, called also *Miringa*, which is a pannicle somewhat thick, sinowy, and strong, yet it is porous, that the vapours may goe forth from the Brain; its figure is plain, extended into a circular form, comprehending within it the whole medullous substance of the Brain, with the *Pia Mater*.

The *Dura Mater* is doubled from the Prow to the Poop according to the length, and in the direct of the Commissure *Sagittalis*, within the substance of the Brain, for the quantity of two inches, dividing the right part from the left; it is also doubled behind according to the breadth, dividing the hinder part of the Brain from the former; this second Duplication is not fastned together as the other first, because the first is joyned together by some Ligaments, and by little Veins, so that in it there is a hollowness apt to hold any thing within it self, and within that hollowness from before to

behind, are many Veins aſcended from the aforeſaid *Guidez*, which are there compreſſed of the aforeſaid Duplication, and being compreſſed they doe preſs out bloud unto many little Branches of them, which are continual with the branches of the *Pia Mater* nouriſhing the Brain.

Toward the hinder part, in that doubling is a certain hollowneſs called *Lacuna*, and *Platea*, and *Fovea*, and *Palmentum*, into which part of this bloud is preſſed, and there is almoſt alwaies ſome bloud there; for which *Erophilus* called that trench the third Vein, becauſe this hollowneſs is very long as a Vein; and elſewhere Chords, as in Veins and Arteries; and in that trench there is not found bloud under the form of bloud; and *Avicen* calleth that doubling *Torcular*. Its quantity, ſituation, Colligancy, and complexion doe appear; in number it is one Pannicle; it helps beſides the aforeſaid, are to cloath the Brain with the *Pia Mater*, according to its length, breadth,

breadth, and depth, only by compaſſing, and by peircing into it, as it appeareth before; it alſo helpeth by mediating between the hard Bone, and the *Pia Mater* which is very ſoft.

It alſo helpeth in ſupporting the Veins which nouriſh the Brain, and the members neer unto it; it ſuffereth paſsions of all ſorts, its notable ſolution is evil.

Of the Pia Mater.

UNder that is another thin Membrane woven throughout with very ſubtile Arteries and Veins, being immediately faſtned to the Brain, called *Pia Mater*, and *Secundina*, becauſe it nouriſheth the Brain, as the *Secundina* doth the young one; and in my opinion in thoſe little Branches of Arteries every where diſperſed in the *Pia Mater*, the bloud or vital ſpirit is made ſubtile and prepared, that in the ſubſtance of the Brain, and in the Ventricles it may bee made animal, as wee have

Pia vel lenis mater quæ media eſt inter duram matrem & cerebrum, ut dura inter eam & craneum.

ſaid in our Commentaries upon *Mundinus*.

This Membrane is ſinowy and thin, and is faſtned to the *Dura Mater* in the top of it, from the Prow to the Poop by many little Veins, and with ſome Veins about the ſides of the Head, and it is faſtned through the whole ſubſtance of the Brain which it nouriſheth; and according to the truth, the two Worms placed within the Ventricles of the Brain, doe draw their beginning from thoſe Veins and Arteries, of which the ſpirit is carried to within the Ventricles, and alſo bloud nouriſhing the inward parts of the Brain; in the walls alſo of the Ventricles is ſome portion of the *Pia Mater* carrying bloud and ſpirit, bloud for the nouriſhing of the parts neer unto it, but ſpirit for the operations of the Soul, as the aforeſaid Worms doe.

From that which hath been ſaid, doe appear its ſubſtance, ſhape, number, Colligancy, and ſituation, and its quantity appeareth, which

which entreth notably, not only into the Brain without, but alſo within the Ventricles, and in many foldings or turnings, although ſome may ſay that the *Pia Mater* is not in the hinder Ventricle, by reaſon of the hardneſs of its ſubſtance, nevertheleſs this part is nouriſhed, and therefore it hath Veins although but little ones; its native complexion is cold and dry; its helps appear; it ſuffereth paſsions of all ſorts, which are worſe than in the *Dura Mater*.

Of the Marrow of the Brain.

AFter the *Pia Mater* doth occur the ſubſtance of the Brain, called unproperly *Medulla*, or Marrow, becauſe it doth not nouriſh or moyſten the bones neer unto it, as the Marrow of other bones, but the bones of the Head are nouriſhed that they may conſerve that.

Medulla quia in medio oſsis vel quod madefaciat oſſa.

Its ſubſtance is to be ſeen, ſofter before, and above, than behind and below; in quantity it exceed-

eth the quantity of the Brain of other living Creatures, as well by reaſon of the multitude of the animal ſpirits, as alſo that by its cold and moyſt complexion it might contemperate them, which come very hot from the Heart.

Its ſituation appeareth, and alſo its ſhape, which is ſuch above, and throughout, as is the form of the Skull, nevertheleſs it hath many manifeſt foldings at the firſt ſight, and alſo many hidden, which are ſeen in the diſſection of it; within which the *Pia Mater* annexed to it doth enter throughout; its Colligancy appeareth, and will appear by the knowledge of its Nerves.

In number it is one member, yet it hath two parts which are not altogether ſeparated from one another, but notably united.

One part notably exceeding the other in greatneſs, is from before unto behind, filling the whole hollowneſs of the Skull before, and in the middle from the top to the bottom, and behind it filleth only the higheſt

higheſt part of the Skull, being alſo in the direct of the greateſt part of the Bone *Lambda*, and this part is called the former Brain.

The other part farre leſs than the firſt, called of *Ariſtotle Cerebellum*, and more ſolid than the firſt, filleth up the hinder and lower part of the Head, and this hath its place in the hinder part of the Head, under the firſt part aforeſaid; but in this hinder part of the Brain called *Cerebellum*, there is not any concavity, or ventricle (as many note) It is well covered every where of the *Dura* and *Pia Mater*, and the ſenſe ſheweth all theſe things; the firſt part aforeſaid is notably divided of the *Dura* and *Pia Mater* into two parts, according to the length of the Head, that is, into the right and left part, that its ſubſtance and its Ventricles might be diſtinct and doubled.

Firſt therefore, remove diligently with a Razor in the other of the ſides of that Duplication, (ſide-ways according to the top

and bottom) the *Pia Mater*, together with a notable quantity of the Brain, going down for the ſpace of three fingers more or leſs, according as you ſhall finde the Ventricles of it.

For in every ſide of that doubling you ſhall find one notable hollowneſs called a Ventricle, which is extended long-ways, ſomewhat obliqued, deſcending toward the hinder part of the ſides.

One ſide being ſeen, ſee likewiſe the other, in which you ſhall ſee the very ſame as in the former; and theſe Ventricles are divided from the ſubſtance of the Brain, that if hurt ſhould happen to one part, it might not happen to the other; and the operations of the one part of thoſe Ventricles are like unto the other fellow to it.

In that Ventricle on both ſides is one pellicular red ſubſtance called *Vermis* the Worm, compounded of Veins and Arteries, which reacheth from one end to the other of each Ventricle, which hath

motion

motion (according to ſome) voluntarily opening and ſhutting the Ventricles.

Beneath thoſe Worms at the ſides of them is a certain eminent part of the Brain, which many doe liken to mens Buttocks in ſhape, which in the lengthning, and in like manner in the ſhutting of the Ventricles doe touch one another, but in the ſhortning and opening of them they are ſeparated one from another.

In thoſe aforeſaid Ventricles, in the former part of them there is commonly placed Fantaſie, Common Senſe, and the Imagination.

The aforeſaid things being ſeen, remove a notable part of the Marrow of the Brain, that the other hollowneſſes of the Brain may be more diligently ſeen, noting in the formoſt *Baſis* of the two aforeſaid hollowneſſes one hole, which is common to the aforeſaid cavities, by which the ſpirit, and alſo ſome Humidities contained in them, doe by deſcending goe forth

forth to a certain hollowneſs reaching toward the Bone *Baſilare*, about that place where there is a certain glandulous fleſh under the croſſing of the Optick Nerves.

This hollowneſs is called of *Mundinus*, *Lacuna*; of *Avicen*, *Caput Roſæ*, and of others *Embotum*, becauſe it is broad above, narrow below, every where compaſſed of a thin pannicle unto the Bone *Baſilare*, and by that *Embotum* to the aforeſaid bone (pierced there with very ſmall pores as a Sieve) are the ſuperfluous moyſtures of the Brain for the moſt part emptied, which afterwards in many turnings of the Bone *Baſilare* placed above the bone of the Palate, are thickned of the air drawn by the Noſtrils, and of the natural heat, and at length are ſent forth by the Noſtrils & Mouth, by means of the Jaws, in that form which is known to all, having by reaſon of divers cauſes a divers ſubſtance, colour, quantity, and figure; from that which hath been ſaid, doth appear

the

the helps of the Brain, which nevertheleſs are of one ſort from *Ariſtotle*, and of another from *Galen* and his followers, which ſee; it ſuffereth paſsions of all ſorts; its ſolution is deadly, not always but for the moſt part.

About that *Embotum* toward the hinder part, alſo under the aforeſaid Ventricle, or Ventricles, there is a certain hollowneſs ſomewhat long, whoſe walls are like unto the aforeſaid Buttocks, which ſhut and open that hollowneſs when there is need, either from the motion of the aforeſaid worms which are immediately above them, or from another motion cauſed of the ſpirits.

And that hollowneſs Authors doe commonly put for the middle Ventricle, in which they ſay that the Cogitative vertue is. In the hinder part of this middle Ventricle is a little hole which reacheth to one other hollowneſs, which is deſcending toward the place where the beginning of the *Nuca* is; and this hollowneſs is not in the afore-

ſaid

ſaid *Cerebellum*, as many think, neither is it compaſſed every where of the medullous ſubſtance of the Brain, but it is placed between the hinder and former Brain, compaſſed notably toward the *Cerebellum* of the *Pia Mater* covering it.

And between that laſt hollowneſs, and the aforeſaid middle Ventricle, is a certain glandulous fleſh, called *Conarium*, becauſe it is in the form of a Cone, or Pine apple; this *glandule* there doth ſuſtain many Veins of the *Pia Mater*, aſcending toward the Center of the Brain, that they may nouriſh it; and this *Glandule* doth ſtrain the ſuperfluous Humidities to the aforeſaid middle Ventricle, from which they are purged forth to the aforeſaid *Embotum*; and from thence as it appeareth above.

In that hollowneſs ſpoken of in the laſt place, which is behind the middle Ventricle, being called the hinder Ventricle, Authors doe commonly place the Memo-

rative

rative Vertue, but I think otherwise.

And I say first, that the Apprehensive, Cogitative, and Memorative Vertue are in the first of those Cavities placed for the former Ventricle; as well in the right as in the left, and the Apprehensive or Common Sense is in the former part of it, and the Cogitative in the middle, but in the hinder part of it is the Memorative.

And I say, that the aforesaid Ventricle, which Authors put for the middle Ventricle, is not for the Cogitative Vertue, but is a way for the purging out of many superfluities of the Brain, and for the carrying of spirits to the aforesaid third Ventricle, which spirits serve not to the Memorative Vertue, but to the Motive and Sensitive Vertue, which come from the aforesaid first Ventricle, and are serving to the Common Sense, and from hence it is comprehended that the *Nuca* hath vertually its beginning from the former

mer part of the Brain, and also that the *Nuca* doth substantially arise from the former part of the Brain, as well from the colour of it, as also from the continuation; (which is nevertheles continued also with the *Cerebellum* placed behind) yet it hath greater direction, and also Colligancy with the Brain, than with the aforesaid *Cerebellum*.

But we have spoken these things better, and more fully, in our Commentaries upon *Mundinus*.

Of the Nerves proceeding from the Brain.

νεῦρον ex νεῦω, *Nuto, & flectomotus est flexionis instrumentum.*

After the aforesaid things are to be seen the Nerves proceeding from the Brain, which are commonly seven pair, of every pair there is on either side one like to its fellow; and a Nerve called in Greek νεῦρον, or νεῦρις, is a consimular member, white, viscous in substance, long and round in shape, fast and hard to separate, the Organ of Sense and motion, and the pure sensitives

are

are softer, and colder than the motives.

Therefore take away the Brain lightly, beginning from the former part, and you shall finde in the direct of the upper part of the Nose two white long substances, on either side one, cleaving to the *Pia Mater*, the heads of which are somewhat gross, wherefore they are called of many *Caruncule Mamillares*, or fleshy Teats, and they are the instruments of the Sense of Smelling, which *Galen* calleth not Nerves, because they are soft; in the direct of them the pannicles of the Brain, and the *Os frontis* are perforated as a Sieve, as well for the smells as for the purging out superfluities of the Brain in necessities, because for the most part they are purged forth by the Colatory, which is in the direct of the aforesaid *Embotum*; and there before in the Skull is a certain notable hollowness filled for the most part with air, in which air the sense of Smelling is first received of those Caruncles.

After

After the aforesaid Caruncles you shall see two great Nerves, which serve the eyes for the sight, and these seem to be crossed, but there is yet contention about this under a Judge.

After those is one pair of Nerves, which is placed for the second pair, and these give motion to the Eyes.

After those is a third pair, which is a little while united to the fourth, from which it is afterward separated, and descending it is spread by the Face; and within and below the Bone *Basilare* it is united with the sixth pair to bee spoken of now; and together they make the aforesaid Nerves, descending to the members of the middle and lower Belly, and from them doe arise the Reversives.

Afterward are the Nerves of the fourth pair, descending to the Palate for the sense of Tasting, and these are subtile; yet some take the third pair for the fourth; and contrariwise, as wee have said in our Commentaries, and

there

there wee have declared the cauſe of that error.

After that there is the fifth pair, which is ſpread abroad on both ſides, within the bone *Baſilare*, in the direct of the Ears, and ſerveth to the ſenſe of Hearing.

After that is the ſixth pair, which is mingled with the third, as it is ſaid before; after that is the ſeventh pair, which becauſe it is Oblique, gives motion to the Tongue, and alſo to ſome Muſcles ſerving the *Epiglottis*, it alſo giveth the ſenſe of Taſting to the Tongue it ſelf.

The ſubſtance of theſe Nerves is known to all, yet the hinder are harder than the former for the ſenſes within; its figure, quantity, ſituation, number, and Colligancy appear; in complexion they are not very dry, and therefore they have not ſtrong motions; and they are cold by nature; their helps alſo appear; they ſuffer paſsions of all ſorts, all which are evil, becauſe of their colligancy and operations.

Of the Rete Mirabile, *according to the common opinion, and somewhat of the* Nuca.

Rete mirabile ex textura mirabili.

THe aforesaid things being seen, I lay aside the whole Brain, with that portion of the *Nuca* which is between the Spondiles, which you cut, and kept with the Head; first noting its situation, substance, number, and figure; its Colligancy with the Brain is spoken of above; its quantity and other things requisite unto it, shall bee better observed from that which is to be said; in the beginning whereof neat to the Brain is a certain hollowness, continued to the hollowness commonly placed for the Ventricle of the Memorative Vertue, by which the spirits sent from the Brain, for sense and motion, doe pass to its Nerves; and the *Nuca* (as also the Brain) is covered of the *Dura* and *Pia Mater*, as the sense doth demonstrate.

Those

Thoſe things being noted, above there is only the *Dura Mater*, becauſe by removing the Brain the *Pia Mater* is alſo removed, by reaſon of the firm and continual Colligancy of them together.

Between the *Dura Mater*, and the bone *Baſilare*, in the region of the croſsing of the Optick Nerves, where the aforeſaid *Colatory* is, there doe aſcend by the Bone *Baſilare* two notable Arteries, one on the right, the other on the left, as it appeared above in the Chapter of the *Aorta* aſcending; from which (as Authors doe commonly ſay) above the Bone immediately under the *Dura Mater*, are made many very ſubtile branches wonderfully united together, one above another, to the likeneſs of a Net, taking up a great place before, behind, and on the ſides; after this, of thoſe many branches are again bred two arteries like to the firſt, from which the aforeſaid little branches are made; and theſe two Veſſels perfect and great doe afterward a-

ſcend again above the Skull, to branch out even unto the Ventricles of the Brain, carrying ſpirits to them made ſubtile in the *Rete mirabile.*

And about that Net, ſome ſay, that there are two *Glandules* ſupporting it, and they ſay, that the helps of that Net are, that a ſubtilization of the vital ſpirit might be cauſed there, that being divided unto leſs branches it might bee the better altered, and the Animal ſpirit might be made; and perhaps that its little branches might bee more eaſily ſtopt, and might cauſe ſleep, by the vapours railed up from the meat, and made thick by the Brain, falling down.

Nevertheleſs that Net I never ſaw, and I think Nature doth not work that by many things which it can doe by few; but Nature can make ſubtile theſe ſpirits in the leaſt branches of the Arteries, deſcending above the *Dura Mater* cleaving to the bone *Baſilare*, and aſcending by the *Pia Mater* even unto

unto the center of the Brain; therefore this Net is not given there between the *Dura Mater*, and the bone *Basilare*; many other reasons have I spoken upon this in my Commentaries upon *Mundinus*, to which for brevities sake I referre the Readers, and among other reasons, sensible experience is to me a guide.

Nasus a ναςμὸς fluor: propier mucci fluorem; ut ῥίν a ῥέος fluo græ: sic Latin: nasus a no, per quem excrementa fluunt & quasi emanant, quod etiam spiritus innatet & enatet.

Of the Nose.

THe aforesaid things being seen, the speech of the bone *Basilare* should concur; but because the Anatomy of it, especially of the number of its parts is placed diverse among Authors; and also because this Bone is better seen in Church-yards, than in a Common dissection, therefore I shorten my speech concerning them, and referre the desirers of this Art to our Commentaries, and to Church-yards.

Let us therefore speak somewhat of the Nose, which for the present is taken for that principal e-

minent part, which being set with an equal ridge on the center of the Eye-brows, doth distinguish and fence either sight of the Eye; the lower lateral parts of this member *Galen* calleth *Alaria*, they are otherwise called *Alula*; its upper part is called *Lepor*, and *Summum Nasi*, the lower part *Imum Nasi*, the middle exteriour part is called *Columna*, and the inner part of it dividing the right side from the left, is called *Septum porrectum*, and *Interfinium Nasi*, and some doe call the lower holes of the Nose *Nares*, but for the present the hollownesses placed above the Palate in the bone *Basilare*, are of us called *Nares*, in which the moyst superfluity of the Brain being strained through, is made thick; of which we have spoken somewhat above.

The substance of the Nose is of Skin, Muscles, Cartilages, and Bones, and of the Pannicle covering its bones; its skin is so united to its muscles that it cannot (but with difficulty) be separated; its former

former and lower part is Cartilagineous, but its upper part bony; its muſcles are two ſmall ones, but hard, one on the right hand, the other on the left, more toward the lower part, becauſe both doe ariſe from the balls of the Mandibles, and they move the wings of the Noſe to what part a man will.

After the Muſcles are three Cartilages, one in the middle, and two on the ſides, which are ſofter than the middlemoſt, which is hard enough, that it might keep the Noſe (which it divideth within by the middle) ſtraight and ſtrong.

The Bones of the Noſe are two, triangular, touching the Forehead, perforated with ſmall holes towards the corners of Tears, by which the Humidities in the Eyes may penetrate, and from the Eyes into the Noſe, and from the Noſe into the Month, and by reaſon of this the ſavour of Medicines put into the Eyes is taſted of the Tongue.

And the *Os frontis* in the direct of the Nose is perforated as a Sieve, that it might serve for smelling, and that by them holes the superfluous moystures might goe forth from the Brain, passing first by the holes which are in their Pannicles, about the places of the Mamillary Caruncles.

From that which hath been said, is seen the substance of the Nose; in number it is one member, but divided into two parts at the inside, that if one part should bee hurt, the other might be firm; its figure, quantity, situation, and colligancy appear; its complexion is appointed cold and dry; its helps are for comlinesse, and for carrying and re-carrying air to the Lungs; they also carry the matter forth from themselves, sent through the *Colatory* to the aforesaid Caves, which Caves are for the present called *Nares*.

They suffer passions of all sorts, and their solution is easily consolidated; in the lower end of it are sometimes applied Horse-

leaches

leaches for safety, and such like; its proper passion is the annoyance of the Olfactive Vertue, which may happen to it principally by reason of opilation caused in the holes that are in the Bone *Basilare*, in the direct of the aforesaid mamillary Caruncles.

Of the Eye-lids.

Palpebræ à palpacido id est praetentando objecta, βλέφαρα grac: quasi τῶν βλέποντες φάρεα hoc est visus tunica.

PAlpebræ of *Palpitando*, of stirring, called also * *Genæ*, are the pellicles covering the Eyes, known to all; their substance is of Cartilage and Membrane, with a very little (and it may be as it pleaseth some) with no fleshy part, the Muscles excepted, and it is Cartilagineous, that the Hairs may be fastned in it, which stand strait, and hard, that they may the better defend the Eyes; these are called *Cilia*, *a Celando Oculis*, of covering the Eyes; it is also Cartilagineous, because it better resisteth outward things, and that it might stand upright when it is opened, because if it should bee pel-

Genæ à γεννάω genero ibidem pili geneantur.

Aristot.

pelliculat it ſhould eaſily bee depreſt, and it is covered with skin for defence and comlineſs.

In the upper Eye-lids under their skin is a Pannicle proceeding from the *Pericranenm*, which is turned inward, involving their Cartilage without and within, even unto the tunicle *Cornea*, the *conjunctiva* being between covering the muſcles of the Eye, and in the lower in like manner there reacheth a Pannicle, riſen from the Pannicle covering the balls of the Face, and by that means it ſeemeth that the tunicle *Conjunctiva* ſhould ariſe alſo from the Pannicle covering the lower bones of the Face.

About that Cartilage which *Galen* calleth *Tarſum*, there is ſome fat moyſtning them for neceſſities ſake, leſt they ſhould be dried up by reaſon of their almoſt continual motion; the upper alone are moved, but not the lower.

And on either ſide their motion is of three Muſcles, witneſs *Avicen*, whereof one openeth, which

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is in the middle, but the two others are in the corners, which shut, yet *Galen* 10. *De Utilitate, cap.* 8. seemeth to place but two Muscles, whereof one is said to bee in the corner toward the Ear, wch he saith doth open if it bee moved alone, and the other in the corner of the Nose, which hee saith doth shut if it bee also moved alone; and if both be equally moved the eye-lid is not more shut than it is opened, and this half shutting is called of *Hippocrates*, *Curva Palpebra*, a crooked eye-lid, which in Sicknesses doth inferre an ill sign; and also *Galen* saith in the same place, *Cap.* 10. that hee never knew the aforesaid muscle placed at the corner of the Nose, because hee saw great Cauteries to be applied there for Fistulaes, and nevertheless the motion hath yet remained in the Eye-lids, which had not remained if the muscle had been there.

And he doth affirm, 11 *De Utilitate, cap.* 14. That the musculous skin of the Fore-head, and of the balls of the Face, by their motion

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tion is ſufficient for the ſhutting and opening of the Eye-lids, and ſome doe adde with the help of the muſcles; but *Ariſtotle*, 2 *De partibus Animalium*, *cap.* 13. ſaith, that the eye-lids move not voluntarily, but by inſtinct of nature; nevertheleſs it ſeemeth to me, that they have a proper motion, and a common, the common is of the Fore-head, and of the balls of the Face; but the proper is of their proper muſcles, which have their Nerves annexed to the Eye-lids, and to the muſcle moving the Fore-head, and to the Temporal muſcles, and to thoſe of the balls of the Face, but whether thoſe Nerves ſhould proceed from the *Nuca*, or from the Brain, it is not perceived by ſenſe; yet *Avicen* ſaith, that in the upper eye-lid only there are Muſcles, becauſe they are nearer to their beginning, that is to the Brain; which are ſmall, and ſome ſay that they are without Chords, about the ſituation of which ſome are diſagreeing among themſelves.

And

And the lower Eye-lids are not moved (witneſs *Avicen*) becauſe the motion of the upper ſufficeth for the perfect ſhutting and opening to one another; and the lower are leſs than the upper, and more joyned to the eyes, leſt by reaſon of their greatneſs, and the ſeparation of them from the eyes, they ſhould gather in themſelves bloud-ſhot, and tears, and other outward things, witneſs *Galen* 10. *De Utilitate.*

In the ſubſtance of the Eye-lids, in either angle or *Canthus*, toward the Noſe, are two ſmall holes manifeſt to the ſenſe, one in the upper eye-lid, another in the lower, by which the Tears goe forth, and in that Angle are ſpongeous fleſhes which contain within them that humidity of Tears, that they might moyſten the members near unto them, leſt they ſhould bee dryed; and thoſe humidities doe come ſometimes from the Noſe, and alſo from the Brain, by the Veins of their pannicles.

The ſituation of the Eye-lids, the

the number, quantity, ſhape, and Colligancy appear; their ſubſtance is handled; their complexion is appointed cold and dry; their helps are to defend the Eyes from ſmall and ſoft things, but the bones adjacent doe defend them from great and hard things; and they help in the cauſing of ſleep; their Hairs alſo doe help the Eyes, leſt when the eye-lids bee open, duſt or other ſmall things might hurt them, and by their blackneſs they doe ſtrengthen the ſight; and they are not very thick, leſt they ſhould ſhadow the ſight; nor too thin, that they might hinder ſmall things to enter into the eyes.

They ſuffer paſsions of all ſorts, and among others they ſuffer the turning in of their Hairs, which is cured by Cauterizing every Hair turned in, in its root, with a golden Needle, afterwards they are cured, as other places cauterized.

Of the Anatomy of the Eyes.

THe Eye-lids being ſeen, the Eyes doe occur, called *Oculi ab occultando* of hiding, for they are hid between the Eye-lids; for the ſeeing of which, firſt cut the *Os frontis* in the direct of them, ſo that at length you may ſee the other of them, in the manner hereafter to be ſpoken, noting firſt its Nerve, which is called *Opticus*, which by perforating the tunicles of it reacheth towards its center; and between the *Conjunctiva*, and *Cornea*, there is a notable fatneſs and glandulous fleſh taking up the humidities, as the glandulous fleſh of the root of the Tongue doth, which it ſtreameth out ſometimes by the Noſe, and by the holes which are in the eye-lids ſpoken of before, by means of which, as well by the fatneſs as by the humidities the Eyes are kept from drying up.

Oculi ab occulendo Varroni, quod ciliorum tegumminibus, ſeu palpebris (ut Lactantius de opificio) occulantur.

There are alſo its proper Muſcles which are ſeven, whereof one moveth

moveth upward, another downward, and one other toward the right hand, another toward the left, and two reaching overthwart doe move circularly, but the seventh is near the Optick Nerve, which it doth sustain and elevate, and defendeth it from relaxing, whilst the eyes are fixed in a continual beholding, and therefore this alone fastneth the Eye; some doe say, that that muscle is doubled, and some that it is trebled, and all these muscles have their Nerves from the second pair of the Nerves of the Brain.

The aforesaid things being seen, separate the muscles, the aforesaid fat, and likewise the glandulous flesh from its pellicles, which are really four, yet they are commonly appointed seven, which doe differ somewhat in substance, situation, colour, shape, and quantity, and in complexion, but in Colligancy they doe not differ; they doe also differ somewhat in their helps.

In those Pellicles which are called

led the Membranes, and Tunicles of the Eyes, there are three Humours, yet some doe adde a fourth which they call *Aethereus*, or the Airy Humour.

Therefore of those Tunicles beginning before, the *Conjunctiva* doth first occur; so called, because it joyneth the Eye to the Head; and this proceedeth from the *Pericraneum*, and from the Pannicle of the Bones covering the lower bones of the Face about; but it proceedeth immediately from the innermost pellicle of the Eye-lids, risen from the aforesaid Pannicles; it doth also somewhat proceed from the *Pericraneum* covering the orbs of the Eyes, and this alone is truly one Tunicle.

Nevertheless the *Conjunctiva* doth not cover the whole Eye before; but in the place where that faileth, before the Eye in the middle is the second Tunicle, which because it is clear as a horn, is named *Cornea*, this (according to some) hath four slender Tunicles, as it is found in its Ulcers.

To this *Cornea* toward the hinder part is one Pannicle not bright, but obscure and hard, therefore it is called *Sclirotica*, which covereth the whole Eye behind, yet this is bigger than the *Cornea*, and those two are of some placed for one only for their Colligancy, because they both arise from, or are fastned to the *Dura Mater*.

After them beginning likewise before there is one Tunicle called *Uvea*, and *Coronoydea*, and *Foraminalis*, because it is perforated as a Crown, and as the graine of a Grape when it is removed from that it hangeth by, or the Cluster, and its hole is called *Pupilla*; its colour is various but often black, and party-coloured like the Rainbow, or of an Azure colour.

To this toward the hinder part is fastned one Tunicle, which is almost of like greatness as is the *Uvea*, and also of the same colour, and this is called *Secundina*; because that, and also the *Uvea* doe proceed from the *Pia Mater*, called *Secundina*; or as it pleaseth some

ſome, becauſe this *Secundina* nouriſheth the Eye, as the *Secundina* the young one.

Between the *Secundina* and the *Uvea* is the Humor called *Albugineus*, wch in the direct of the *Pupilla*, cometh even unto the *Cornea*, and there this Humour is bright, more clear than in another place, and therefore ſome ſay that this Humour is called *Aethereus*, or the Airie Humour, and ſo doe appoint Four Humours; and becauſe thoſe two aforeſaid Tunicles doe ariſe from the *Pia Mater*, ſome doe ſay that thoſe two are one only.

After thoſe Tunicles are two others, one before, another behind, which is bigger than that before; the former is called *Aranea*, the hinder *Retina*; *Aranea* is ſubtile, but compact, more bright than an Adamant Jewel; *Retina* alſo is ſubtile, but not bright as *Aranea*.

Between theſe are two Humours; toward the hinder part, and on the ſides is the Vitreal

Humour, which is like unto liquefied glaſs, yet it is ſomewhat thick and viſcous, in the former part of which is placed the Chriſtalline Humour, as a Gem is placed in a Ring; the Vitreal Humour is farre greater than the Chriſtalline, but the Chriſtalline is harder than the Vitreal, and it is bright as a Gemme; alſo thoſe aforeſaid two Tunicles doe ariſe from the Optick Nerve (according to Authors) and therefore they are placed for one, which nevertheleſs, whether they be one or two, as likewiſe the reſt, doth little concern the Phyſician; and the Optick Nerves are (according to ſome) notably perforated, nevertheleſs the ſenſe denieth this in a dead Creature; we have ſpoken of other things concerning the Eyes in our Commentaries.

From that which hath been ſaid, is ſeen the ſubſtance of the Eyes; they are ſituated in their Orbs, that is in two great holes placed in the Fore-head, and they are not very

very eminent without, leſt they ſhould be hurt of outward things; and for this cauſe they have the Eye-brows eminent without, and below the bones of the balls of the Face; their number, Colligancy, ſhape, and quantity appear.

Their complexion by reaſon of the Humours is ſet down cold, and moyſt; and by reaſon of the Pannicles is ſet down cold, and dry; and by reaſon of the multitude of the ſpirits is ſet down warm; their helps are known to all; they ſuffer Paſſions of all ſorts: their proper Paſsion is the taking away, diminiſhing, and corruption of the ſight.

If you cannot ſee all theſe things in one Eye, ſee them in both, at leaſt ſee in one the muſcles, and the glandulous fleſh, with its fatneſs, and alſo the *Conjunctiva*; but in the other ſee the Tunicles, and Humours; yet a learned hand doth ſeek after harder things.

Of the Ears.

AFter the Eyes doe occur the Ears, called *Aures ad hauriendis vocibus*, from drawing Voyces, or becauſe they are *Audes vocum*, hearers of the Voyce; and as well the Cartilage of them as the holes are called *Aures*; their upper part is called *Pina*, or *Pirula*, and *Lobus*, but their lower *Fimbra*, and *Lobus*, where there are certain Veins flowing notably; if they receive ſolution, their inward part is called *Scaphus*.

Aures ab hauriendis vocibus Lactantio & Virgilio; alii ab aura, quod ſonus per auram defertur; alii a Græ. ἀυδὴ vox.

Their ſubſtance is Cartilagineous, that it might bee ſafe from outward things, and ſhrill; they are without motion for the moſt part; ſome doe think that the Memorative Vertue is in the lower part of them, therefore thoſe that would remember doe rub thoſe parts; the truth is, that that laſt concavity of the firſt Ventricle of the Brain being doubled (in which I doe place the Memora-

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tive Vertue) doth reach obliquely toward the Ears, and perhaps that by reason of this the rubbing of those parts doth help the memory.

These members are covered with Skin, yet they have some flesh very firmly united to their skin; there is not sense in them, unless a little; their shape is known to all; they are winding as Periwincles, that the air making the sound might the better flow into them without violence.

Their perforation is in a bone more thick than any other part of the Skull, within which is a certain hollowness, which a certain thin and solid Pannicle doth cover, risen (according to some) from the Auditive Nerve, which is of the fifth pair of the Nerves of the Brain.

In the aforesaid hollowness, which the aforesaid Pannicle doth cover before, is implanted air, which receiveth the forms of hearing, which it giveth to the Auditive Nerve, dilated into the Pannicle,

nicle, which is called *Miringa Auris*, and then the ſenſe of hearing comprehendeth the Vocal wave, and every other ſound coming to it.

And to this Pannicle within the aforeſaid hollowneſs, are added two little bones apt to bee moved of the air there in the next motion, which in their motion doe ſtrike one another, of which according to ſome, are cauſed all the forms of ſound more and leſs, according to the air moved without.

There are ſome which would have the aforeſaid Pannicle to riſe from the *Pia Mater*, which paſſeth with the Auditive Nerve to the aforeſaid hollowneſs; but concerning its beginning ſee our Commentaries.

For the well ſeeing of theſe things, there is required a learned hand, with Tenacles, a crooked Knife, a Saw, and a fit Mallet, becauſe the aforeſaid things, as well the Nerve which cometh from within, as the *Miringa*, which

is toward the Orifice of the Ear, with the little bones, are seen with difficulty.

From the aforesaid things is seen the inward, and outward substance of the Ear; its situation, quantity, shape, number, and Colligancy appear; their complexion is cold and dry; their helps are known to all; they suffer passions of all sorts; their proper passion is the hurt of the Auditive Vertue.

Of the upper Mandibles.

THe Ears being seen, lest any part of the Head should remain untouched, I come to the upper Mandibles, which are placed after the aforesaid members, for better orders sake; those Mandibles have only two proper bones under the Nose, and are divided by one only commissure by the length of the Palate; in which are the Teeth, which are in shape, name, and number like to those which are in the lower Mandibles.

Mandibulæ à mandendo, cujus in actione non parum adjuvant.

These

These upper Mandibles are (according to some) compounded of twelve and more bones, but improperly, because they doe adde them of the eyes, and *Ossa Paris*, and those of the balls of the Face, and other bones, to the two aforesaid bones.

The substance, number, quantity, situation, shape, Colligancy, and complexion of these Mandibles appear; their helps are those which are of the lower, and which are of the Palate; they suffer passions of all sorts.

Of the Involutions above the Palate.

Palatum quod labiis dentibusque quasi palis munitum sit, vel Palatum quasi palam latum.

FRom the *Fauces* above the Palate, to the holes of the Nose, is an ample way, by which a man continually breathes to and fro; to this about the top are certain little Vaults, windings, or caves, placed under the *Colatory* below the *Embotum* of the Brain; the bony walls of which are subtile and pelliculiar: hence by the holes of

of the Nose, and by the *Fauces*, the gross excrements of the Brain are streamed forth to the mouth.

For the well seeing of those, the great hole of the bone *Basilare*, by which the *Nuca* descendeth, being first seen, and those Spondiles of the Neck being well shewen, which you took away with the head, divide the Bone *Basilare* with a Saw, or Falx, through the middle, even unto the Palate inclusively, and you shall see all the aforesaid things very well.

Of the Anatomy of the Extreams.

THe Head being dispatched, in a common dissection, the hinder part of the Neck doth first occur, called * *Tenon*, and * *Cervix*, whose situation is from the Bone *Basilare* of the Head, even unto the seventh Spondile inclusively, descending from the head downwards.

This part hath parts contained, and containing; the Containing are the Skin, the Muscles, the Pan-

* *Ruffo* τένων *à* τείνω *Tendo, sic etiam Lat. Tendo quia in capitis motu tenditur.*

* *Cervix quasi Cerebri via.*

Pannicles, and the Spondiles.

The Contained are the Membranes covering the Nuke, the *Nuca* it ſelf, with its Nerves, Veins, and Arteries.

Of the Containing, ſome are without, ſome within; thoſe which are without, ſome are above, ſome below, and ſome in the middle.

The upper outward parts are called of ſome *Fontanella Colli*, and it is the place where the firſt, and alſo the ſecond Spondile are joyned to the Head; this place is called of *Avicen*, 4 *Primi*, *Alchadam*, in which are applied many Cauteries for divers diſpoſitions of the Head, and there alſo are *Setons* placed.

Its loweſt part is called of *Avicen*, *Alchael*, or *Alchel*, and the middle part between theſe is called *Nocra*.

From *Alchael*, even unto the *Alkadam* incluſively, there are between every Spondile actual Cauteries applied to Children, in preſervation from the Epilepſie, and it is a ſingular remedy.

Among

Among the outward parts containing is alſo placed the Skin firſt occurring, which is to be excoriated, that the other outward parts containing may bee ſeen, to wit, the Muſcles, which in this Section are placed after, for the reaſon ſpoken of in the Anatomy of the former parts of the Neck, which nevertheleſs by the excoriating may be ſhewen after a certain confuſed manner, and caſting them away, firſt noting the quantity, ſubſtance, ſituation, complexion, and ſhape of them; the number, Colligancy, and helps of them being omitted, which cannot bee wholly comprehended, by reaſon of the diſſection of the head placed before, and of the former parts of the neck; which things being ſeen, the bones of the Neck doe occur, placed among the former parts containing.

Theſe Bones are called *Spondyli*, and they are ſeven, which are more ſubtile than the reſt, becauſe they muſt bee light, leſt they ſhould burden the body, and they

are

are such because *Nothos*, called corruptly *Nuca*, is grosser there, which by descending is alwaies made more subtile, because it sendeth part of its substance for every Spondile; yet the first Spondile united to the Head, is grosser in the hinder part than the other six, yet it hath a broader perforation, and the greatest part of the Spondiles unto the *Os Sacrum*, have wings and eminences, which this first is without, that the head might the better bee bended to the hinder part, and lest it should tear the Nerves going forth from the *Nuca* neer unto them; in that Spondile also toward the upper part are two pits, in which doe enter two peeces of the Bone *Basilare*, near unto that great perforation by which the *Nuca* goeth forth; it hath also two other pits almost alike toward the lower part, in which doe enter two peeces of the second Spondile, although there be some that say, that those peeces are in the first Spondile, and doe enter into

into the ſecond; the firſt Spondile is united to the Head by ſtrong ligaments, upon which it is bended ſide-waies.

After the firſt Spondile followeth the ſecond, which differeth from all the reſt in ſhape, for this Spondile hath in its top a certain additament, which *Hippocrates* calleth a Tooth, but of *Galen* it is called *Pyroydea*, becauſe of its ſharp form, and this additament entreth into a certain pit which is in the firſt Spondile, diſtinct from the perforation by which the *Nuca* goeth forth; and by reaſon of this the Head is ſafely moved forward and backward, and round about, or Obliquely, without the diſlocation of the aforeſaid Spondiles, which would bee eaſie, if the aforeſaid additament ſhould not reſiſt it; becauſe the juncture of the ſecond Spondile with the firſt, is looſer than any other found in the whole Spine; alſo the other junctures of the Spine of the Neck are looſer than thoſe that are below them, and they have

have their bones *Simenia*, forked and ſmall, leſt they ſhould burden the body.

After the Spondiles of the Neck doe follow twelve Spondiles, to which are united on both ſides twelve Ribs, and thoſe are called the Spondiles of the Back.

After thoſe doe follow five Spondiles called *Lumbares*, and *Renales*, that is, belonging to the Loyns and Reins, and there are the Kidnies, and two Muſcles called *Lumbi*; *Avicen* calleth that Region *Alchatim*; and theſe are bigger than the reſt, and the place which is between the uppermoſt of them, and the lowermoſt Spondile of the Ribs, is called of *Galen Glutum*, and of *Homer Acruſta*, in that region is faſtned the *Diafragma*.

After thoſe Spondiles doe follow three others, which are not Spondiles unleſs unproperly, and theſe are called of *Avicen*, *Spondili Alhavim*, and of *Averroes* they are called *Oſſa Agit*, and of *Galen Os ſacrum*, and *Amplum*; but this

Os

Os sacrum, according to *Galen*, consisteth of four bones, with which the *Ossa Ancharum* are continued, which are very firmly united with that bone on both sides, and by the command of Nature they are opened, or separated from one another in the birth; also those *Ossa Ancharum* are in such a time opened in the *Pecten*, wherein other times they are also naturally very firmly united.

After those bones first appointed, three by *Avicen*, are also three others, called *Ossa Alhoses*, and *Caudæ*, and so in all the true and false Spondiles are commonly in number thirty, of all which the substance is bony, with some cartilage placed between their junctures, and they are all firmly conjoyned by Ligaments, lest they should be easily dislocated by their motion. Their quantity, shape, situation, and Colligancy is to bee seen; their complexion appeareth; their helps are to defend the *Nuca*, and its Nerves placed within them.

They are also a foundation of the whole body; but the Spondiles of the Reins, and *Alhovius* doe principally this; they suffer passions of all sorts.

For the well shewing of these Spondiles Church-yards are requisite, our Commentaries upon *Mundinus* being somewhat helping; and that their inner substance may bee well seen, and in like manner their Marrow, commonly called *Nuca*, divide the Spondiles through the middle from the head to the tayl with a great Falx, preserving as well as you can the *Nuca*, and its Nerves unhurt; this dissection being made, you shall consider their Bones and Cartilage, and the Pannicle covering the inward part of them, and also the Ligaments with which these Vertebraes or Spondiles are united together; these being seen return to the *Nuca*.

Of the Nuca.

THe Spondiles being ſhewed, the parts contained within them, as well in the Neck as elſewhere, are to bee ſeen; the chief of whom is the *Nuca*, with its Nerves; the other parts are two hard Pannicles, and one ſoft, that which is harder than the reſt cleaveth to the bones, the other is inſtead of the *Dura Mater*, being alſo hard; the other is ſoft, inſtead of the *Secundina*, or *Pia Mater*, all compaſsing about the *Nuca* it ſelf, and the Nerves.

Nuca vox Africa fortè a nuce dici poſsit Nuca enim ſpondilis includitur ut nuce nucleus.

The ſubſtance of the *Nuca* is viſcous, moyſt, with ſome ſolidity, and it is like to the ſubſtance of the Brain, but ſomewhat harder, and by how much the more it deſcendeth it waxeth the more hard; neither is it Marrow (as neither the Brain) as ſome doe think; its ſhape appeareth to all.

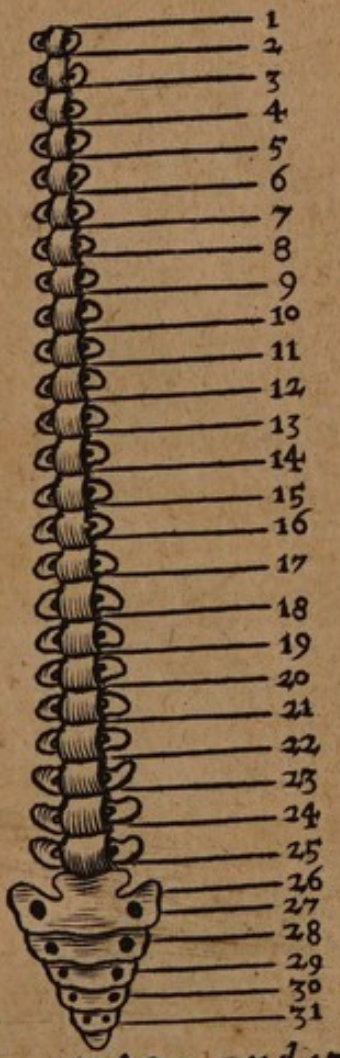
Its ſituation and place is from the loweſt part of the Head, deſcending unto the ſecond upper-

moſt Spondile of the Reins inclu-ſively, and it doth not paſs that place; but from that place down-wards. The whole ſubſtance of the *Nuca* is divided into many Nervs, which by deſcending even unto the laſt Spondile of the *Cauda* are divided through them; the num-ber and quantity appear; it hath Colligancy with all members unto which its Nerves doe paſs; it is alſo faſtned to the Liver, and to the Heart by means of the *Aorta* and *Chilis*, by certain very little Veins and Arteries, reaching to it through the holes of the Spon-diles; theſe Veins and Arteries doe perforate the aforelaid hard Pannicles compaſſing it about, and doe enter into the ſoft Pannicle riſen from the *Pia Mater*, by means of which cleaving unto it, that they may be ſupported, they doe nouriſh and give life to the *Nuca*.

Its complexion is commonly appointed cold and dry, but ſome think otherwiſe.

Its helps are that Nerves might

paſs



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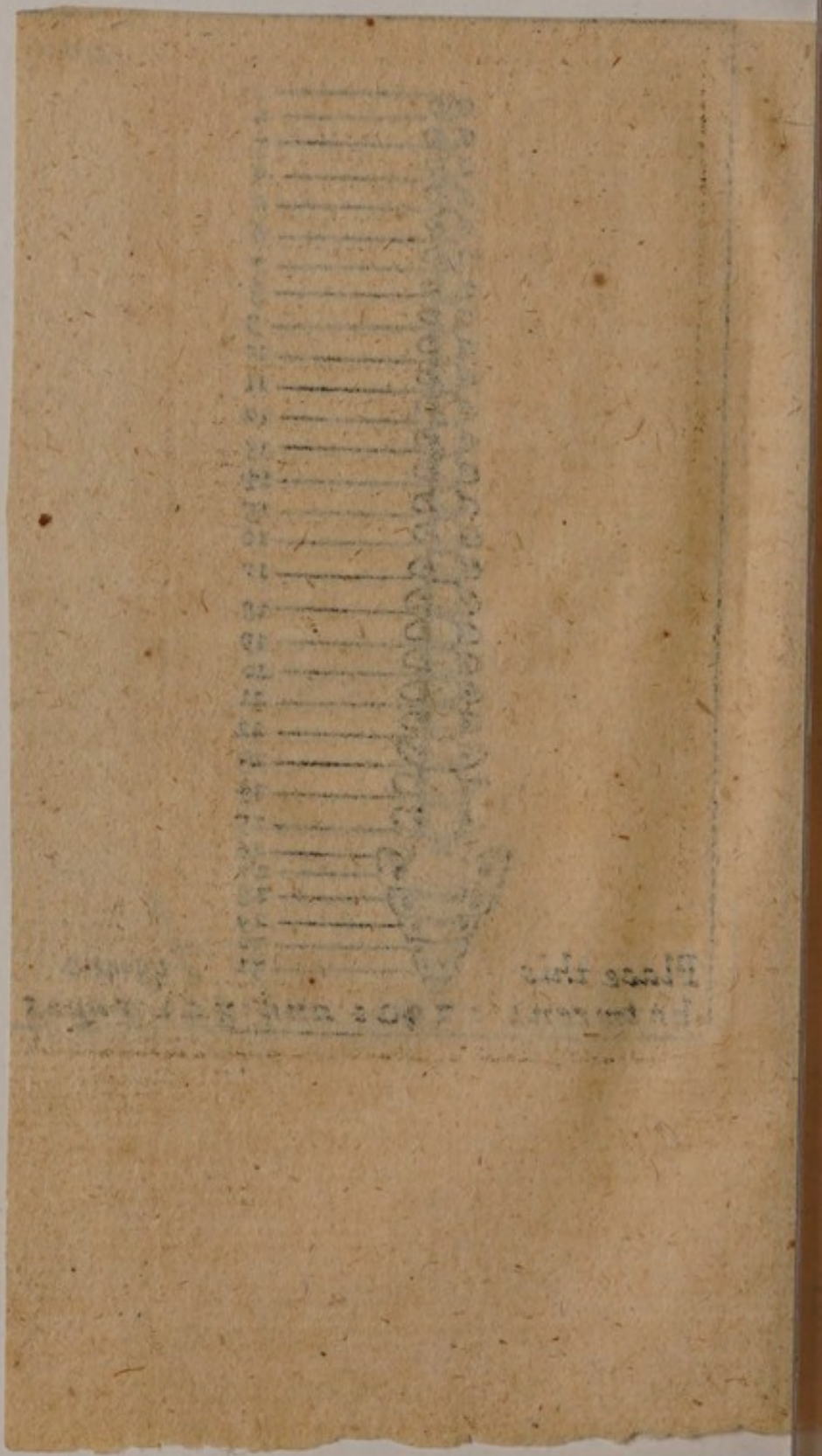

pass from it to the members, not in so great a distance as if they should come from the Brain, and that the Nerves might bee more distinct, not hindring one another, and that they might bee drier, and lest from their hurt the Brain should immediately bee hurt; and also if there should not be a *Nuca*, the Brain should bee bigger, and should too much burthen the lower members; it suffereth passions of all sorts.

Of the Nerves risen from the Nuca.

WHat a Nerve is, wee have spoken somewhere else; not only the substance of them, but their shape and complexion; from the head therefore descending to the end of the Spine of the back are Nerves risen from the *Nuca*, and these are thirty one pair, and one Nerve without a fellow, numbring them thus; the first pair of Nerves goeth forth from the first Spondile, one

Nervus Gra: νεῦρον, παρὰ τὸ νειοθάι δι' ὅλου τοῦ σώματος *quod per totum corpus diffundantur.*

Nerve on the right, another on the left, as they are alſo alwaies in all the other Spondiles; and the ſecond pair goeth forth from the middle between the firſt and ſecond Spondile; and in like manner is the third pair between the ſecond and third Spondile of the Neck, and every Spondile deſcending hath one pair of Nerves correſpondent unto it, either in the Orifice of its fellow, or in the Orifice proper to its ſelf, and the laſt Spondile *Alhovius*, which is contiguous to the firſt of the three Bones, *Alhoſos*, or *Caudæ*, hath its pair of Nerves, as likewiſe the Spondiles above it; but between that and the firſt of the Spondiles *Alhoſos*, is another pair of Nerves, and by reaſon of that doubled pair there are thirty one pair, and one Nerve unfellowed; becauſe by deſcending between the firſt Spondile and the ſecond there is one pair, and between the ſecond and the third there is alſo one other pair, but from the laſt Bone which is properly called *Cauda*, goeth

forth

forth one Nerve only; and as ſo there are thirty Spondiles true and not true, and one Nerve without a fellow.

Their Colligancy is better known from whom than to whom, and they have Colligancy with the greateſt part of members having motion; their ſituation and quantity appears, as alſo their number; the helps of thoſe Nerves are to give motion and ſenſe; they ſuffer paſsions of all ſorts.

From the aforeſaid things doth appear, that in a mans body there are thirty eight pair of Nerves, and one Nerve, which in all are ſeventy ſeven, thoſe two excepted which goe to the Noſe for the Olfactive Vertue, which are not commonly termed Nerves, becauſe they are too ſoft; yet I call them Nerves, in as much as they are the Organs of the ſenſe of Smelling, and as ſo there are ſeventy nine, vvhereof ſixty three come from the *Nuca*, and fourteen from the Brain, or ſixteen, the

Mamillary caruncles being reckoned with them; of which it hath been spoken above in the Anatomy of the Nerves of the Brain, which afterwards are terminated to infinite Branches, and Fibers, which sense doth not comprehend, and these are thus,

The Nerves coming from the Brain are seven pair, or eight.

The Nerves of the *Nuca* of the Neck are eight pair.

The Nerves of the *Nuca* of the Back, and of the Ribs are twelve pair.

The Nerves of the *Nuca* of the Reins, or *Alkatim* are five pair.

The Nerves of the *Nuca* of *Alhovius* are three pair.

The Nerves of the *Nuca* of *Alhosos*, with the two Nerves, between the Spondiles *Alhosos*, and *Alhovius*, are three pair, and one odde Nerve going forth from the *Canda*.

The Figure of the Spondiles and Nerves.

IN this Figure you may easily see the number of the Spondiles, and you see how from the substance of the first Spondile doe goe forth two Nerves, from either side one, and you may note the number of the Nerves in the extremity of the lines placed in that Figure.

Yet note (Reader) that the Figure hath not a true similitude with the Spondiles, except in number, but their true Figure is seen in the true Spondiles dried in Church-yards.

Of the Anatomy of the Hands.

THe aforesaid things being seen, I doe first come to the Veins of the Hands used to bee Flebotomised; with which also we shall see the Cartilages, the Marrow, the Bones, and the Nayls, the Muscles of such members being let alone, which

Manus à manando quod ex Brachiis manet, vel quod hoc instrumento potissimum actiones è nobis emanent.

which in a common dissection are not shewen; yet the knowledge of Muscles is a very great help in Chirurgery, witnesse *Aver. primo colliget*, and therefore because for the present they cannot be shewen, we will place in the end of the Book certain Figures shewing some Muscles, especially the outmost; we will also place Figures shewing the principal bones.

First therefore doe occur two members placed on the sides, which from the shoulders even unto the extremity of the Fingers are of *Galen* called the great hands; these members (for the present) have three parts.

The first part beginning from the top is commonly called *Adjutorium*, above which is the *Spatula*, which also of some is placed in the great hand.

Under the first part called *Adjutorium*, is the second called *Brachium*, and between these is the juncture called *Cubitus*, but commonly *Brachium* is taken of many for that first and second part aforesaid. Un-

Under the second is the third part called the little hand, and it is properly called *Manus ab emanando, quia ab ista parte fere omnia artificia emanant*; because almost all Handy-crafts doe flow from that part.

Between that and the second is one juncture compounded of very many Bones, called in *Arabick Raseta*, and *Ascam*, and in *Greek* καρπὸς.

Those things being noted, you shall excoriate the whole skin of the great hand with diligence from the Neck even unto the ends of the Fingers; and you shall see, first the Vein *Basilica*, that is *Regia*, or Kingly; the Ancients before *Aristotle* did call that Vein *Jecoraria*, and it keepeth that name yet, because it is commonly called *Vena Hepatis*, the Liver Vein; it is also called *Ascellaris*, or *Axillaris*, because as it appeareth above in the Anatomy of the Veins, this Vein passeth by the *Ascella*, for *Ascella* is that hollow place on both sides, which is under the shoul-

ſhoulders in the lateral part, between the upper part of the Breſt, and the top of the *Adjutory*, which becauſe it hath no vent in many doth ſavour ill; for it is not vented, witneſs *Ariſtotle* in his *Problems*; in theſe places is a notable part of glandulous fleſh, which receiveth ſome excrements of the Heart, as likewiſe the kernels which are about the *Inguina*, and in the Neck about the *Guidez*, not much diſtant from the Ears, which receive the ſuperfluities of the Liver and Brain, and thoſe places are called the Emulctories of the Heart, of the Liver, and of the Brain; and thoſe fleſhes are as it were a mattreſs to the great Veins placed about them.

This Vein called *Aſcellaris*, and *Baſilica*, deſcendeth by the inſide and loweſt part of the Arm, with the Artery fellow to it for a certain diſtance; after that the Vein is notably manifeſted alone about the juncture of the Cubite in the inward part; and there is fleboto-miſed, and helpeth principally for

the

the Diſeaſes of the Breſt, becauſe t is immediately united to the Veins nouriſhing its parts.

But from the Neck, by the outide, there doth paſs from the houlders to that Juncture, by the *Adjutory*, one Vein called *Spatularis*, *Humeralis*, and *Cephalica*, vhich alſo about the Juncture f the Cubite is flebotomiſed, vhich principally helpeth for Diſaſes of the Head and Neck, beauſe it is immediately united to he Veins *Guidez*.

Between them is one Vein eaching over-thwart from the ne to the other, from which it eceiveth bloud indifferently; this s called *Nigra*, *Communis*, and *Media*, becauſe it emptieth from he members of the Head and Breſt, and conſequently from the vhole upper part, by which means t doth alſo empty from the lower parts.

And the *Cephalica* deſcendeth alone for the moſt part, directly even unto the little hand, between the fore-finger and the thumb,

and

and is called of *Albucasis*, and of *Rasis*, and also of me, the true *Funis Brachii*, and of *Cauliacus*, and of *Canamusalus* it is called *Cephalica ocularis*.

This being cut helpeth in Diseases of the Head, by reason of its Colligancy with the aforesaid *Cephalica*, and also by reason of its directness.

But the *Basilica* descending also alone almost unto the hand, by the inside, and lower, is obliqued toward the out-side about the little hand, which sendeth forth branches from it between the little and the Ring-finger, and this being incised emptieth from the Breast by means of the aforesaid *Basilica*.

Between those two Veins of the little hand, there are (for the most part) some Branches between the fore-finger and the middle, and between the middle and the Ring-finger, which incised stand instead of the common Vein; but the branch which is between the fore-finger and the middle, doth more

more participate with the *Cephalica*, and that which is between the middle and the Ring-finger doth more participate with the *Basilica*; and from the *Cephalica* above the Cubite by the out-side of the arm, doth descend one Vein named also of many *Funis Brachii*, which for the most part is terminated in the aforesaid Veins being on the sides of the middle finger; and this *Funis Brachii* is not in use for flebotomy, yet it may be incised in case of necessity, and it would carry from the Head, because it is continued with the *Cephalica*.

There doth also often arise from the common Vein, which is in the bending of the Cubite, one branch which doth descend alone on the outside of the branch of the aforesaid *Cephalica*, between the thumbe and the fore-finger, and therefore some have affirmed, that that branch incised doth help in the Diseases, in which the aforesaid common Vein doth help.

Many

Many times alſo there doth not any Vein deſcend from that common Vein between the Fore-finger and the Thumb, and this I have often noted, not only in that, but in many other Veins I have ſeen them, and alſo Arteries, to differ their ſituation, and in ſome individual their branches are deficient, and in ſome ſuperfluous.

Many times alſo there is a branch between the Fore-finger and the Thumb, compounded of a branch of the *Cephalica*, and a branch of the Common Vein, and then it emptieth from the Common Vein, and from the *Cephalica*, and more from the *Cephalica* than from the Common, by reaſon of its greater directneſs; for the directneſs of the Veins to the Members doe make much for evacuations, witneſs *Galen* in his Book *De Phlebotomia*.

And theſe things for the preſent doe ſuffice for the Veins of the Hands, for the well-ſeeing of which the Figures placed below

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are to be considered, in which are seen the situations, and some names of the principal Veins; the Figures follow.

The first Figures of Veins.

HEre you see in one Figure the true *Funis Brachii*, reaching directly from the Shoulder even unto the Fore-finger, and the Thumb; which in the little hand is called *Salvatella* of *Mundinus*, and of *Dinus*, and of *Ugo*, and of their followers *Sceilen*, which is counted of *Avicen* for one branch of the Common Veins; and you see in both the Figures how the *Basilica* is in the neareſt part of the arm, and nouriſheth it, and how from that, one branch goeth oblique toward the left part of the hand near the Juncture, and goeth between the little Finger and the Ring-finger, and is called *Ascellaris*, of *Galen*, and of his followers, becauſe it is a branch of the *Ascellaris*, or *Basilica*; and that branch between the little and the

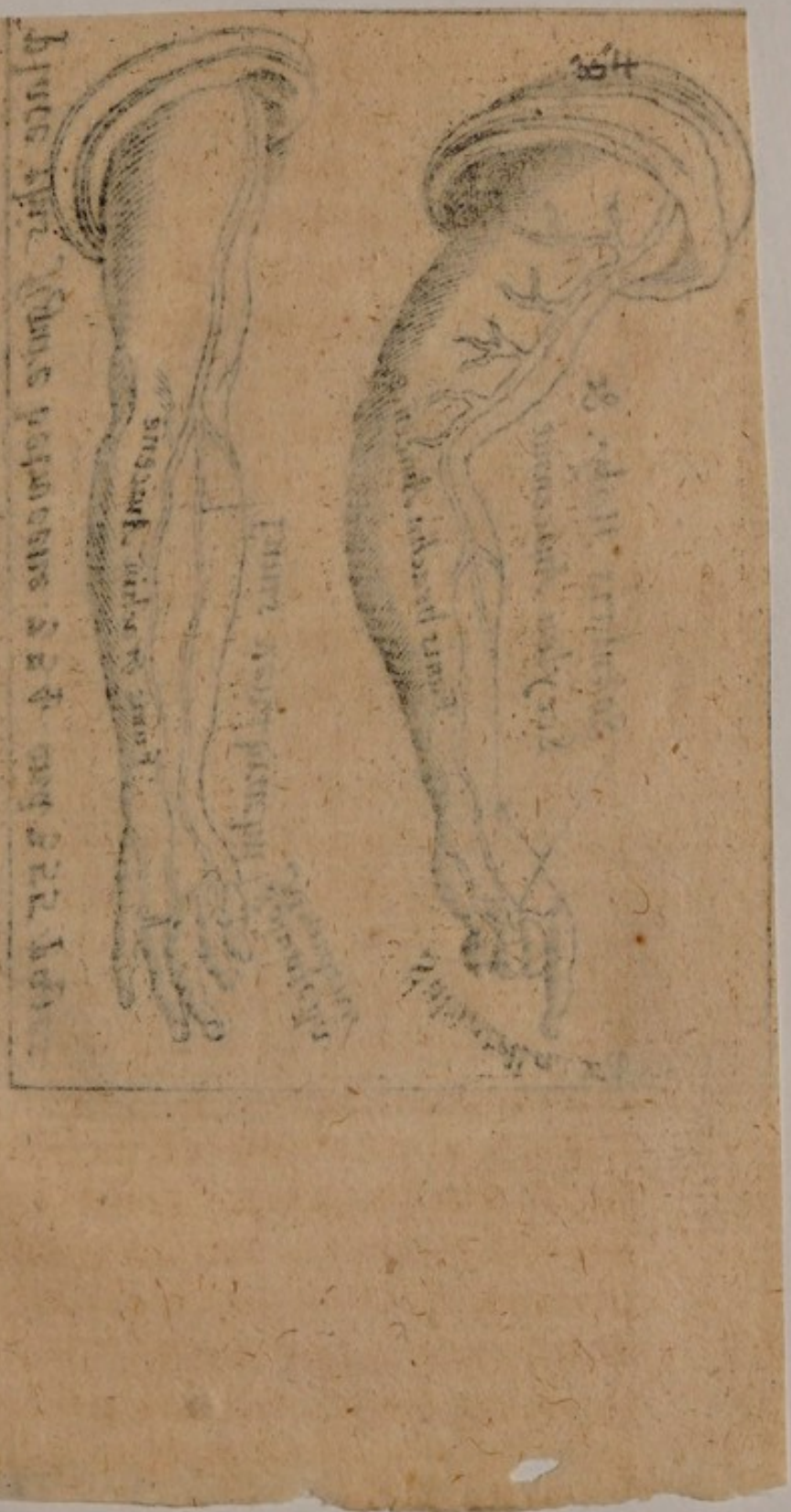
Vena à veniendo, quod per eam sanguis veniat, vel à via, & no, quod via sint natantis sanguinis.

Ring-finger, you ſhall ſee in the following Figure; you ſee alſo in thoſe two Figures, the common Vein, which is a branch between the *Cephalica* and the *Baſilica*, or *Aſcellaris*; and you ſee how from the Common Vein one branch entreth into that branch of the Vein *Cephalica* deſcending, which is terminated between the Fore-finger and the Thumb, which of *Albucaſis* is called *Funis Brachii*; and alſo of others, as it appeareth above.

The ſecond Figures of Veins.

IN theſe Figures is ſeen the place of the *Salvatella* of *Mundinus*, and the place of the *Salvatella* of *Raſis*, and the place of the *Sceilen* of *Avicen*, and the place of the *Salubris* of *Haly*, and the place of that branch of the *Baſilica* which is terminated between the little and the Ring-finger, which Vein *Raſis* called *Salvatella*, and it is ſeen how that Vein which is called *Fu-*

nis



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nis Brachii, of *Avicen*, is terminated about the middle Finger, in a branch of the Vein which is called *Sceilen* of *Avicen*, and *Salubris* of *Haly*; in this Figure also is seen how the true *Funis Brachii* is a branch of the *Cephalica*, which is terminated between the Fore-finger and the Thumb; and in these Figures, and also in the other Figure, are drawn certain small branches which are dispersed through the muscles of the Arms and Hands, and every Vein of our body hath them, which at length are terminated to Capillary Veins, and although every Vein drawn in those Figures hath them not, yet it maketh no matter.

The Veins being seen at least in one hand, because that is enough, all its Bones are to bee laid bare, with which also the *Spatula* is to be seen, made, that the hand might be sustained of it, and lest otherwise the *Adjutory* should be continued with the Brest, because then the facility of the operation of the

hands one to another ſhould bee deſtroyed, and there ſhould be cauſed a ſtraightning; and it was ſeparated from the Ribs, for its ſtrong motion; and becauſe being ſo placed, it might the better defend the members of the Breſt toward the hinder part; and it was on the ſides, leſt in its motion it ſhould meet with the Spondiles, toward which it is thin, and broad as a Splatter, and therefore it is called *Spatula*; its part toward the *Adjutory* is groſs, in the head of which is a certain hollowneſs termed *Pixis*, in which is revolved the upper round extremity of the *Adjutory* called *Vertebrum*.

The *Os Spatulæ* there hath two additaments, one is at the top and behind, which is faſtned with the upper *Furcula* of the Breſt, and is called *Roſtrum corvi*, the Crows bill; whoſe help is to hinder, leſt the *Adjutory* ſhould bee moved from its place to the upper parts; the other of the ſaid additaments is within and below, which alſo doth hinder the diſlocation of the *Adjutory*. This

This Bone upon the back of it ıath a triangular ſubſtance, whoſe *Baſis* is toward the hinder part, and ts eminence is toward the inſide, eſt the ſuperficious part of the Back ſhould be raiſed into a ſharp oint, and ſhould eaſily be hurt, n the extremity of which there is a Cartilage.

Mark, that a Cartilage is two-old; one which is altogether ſof-r than the Bone in any other art of a living Creature, and this in the broader extreme of the one *Spatula*, and in the Breſt, ıd in the *Epiglottis*, and alſo elſe-here in many places; there is al-another Cartilage harder than ıat, which nevertheleſs is ſofter ıan a Bone, and this is in the ex-emities of the Bones of the great unctures, which of *Avicen* is cal-d *Alaguahic*; this cleaveth im-ıediately to the ſubſtance of the ones; but the other Cartilage in ıe aforeſaid Junctures cleaveth to ıat *Alaguahic*; and to the afore-ıaid ſofter Cartilage, the Ligaments in the Junctures doe afterwards

immediately cleave, faſtning the bones together; and theſe things are beſt ſeen in bones boyled to the uttermoſt.

The *Spatula* being ſeen, ſee the *Os Adjutorii*, which is the greateſt of the Bones of the Hand, whoſe ſhape is known to all, ſomewhat crooked, in whoſe hollowneſs, as in many other bones, there is Marrow, called *Medulla*, *quia eſt in medio oſsium*; becauſe it is in the middle of the bones.

For Marrow (witneſs *Ariſtotle*, *ſecundo de partibus animalium*) is a nouriſhment of Bloud, and it is a concocted and contained excrement; and (*Avicen prima primi* ſaith,) that the bones are nouriſhed of it; and hence is Nature known artificial, which ſince Shee hath not alwayes Veins fit for the Bones, putteth their nouriſhment in their Pores and Concavities; and alſo if it be a ſuperfluity, Shee likewiſe putteth the excrement in them, ſince She hath not another place fit for the aforeſaid things.

The lower extremity of the *Adjutory*

jutory Bone hath two eminences, with which it is joyned with the two *Fociles* of the Arm, making with ſtrong Ligaments the juncture of the Cubite; and in the hollowneſs which is between the aforeſaid eminences, doth enter the extremity of the lower *Focile*, which is greater than the upper, which is crooked, that the Juncture might be the more firm for the continual (as it were) and ſtrong motions of this Juncture, which for this cauſe alſo is ſeldom diſlocated; and if it bee diſlocated, it is with difficulty reduced into its former degree; the *Fociles* of the Arm are alſo hollow, becauſe all Bones are either hollow within, or porous, that they might bee light, leſt they ſhould burthen the body.

And the extremities of thoſe *Fociles*, and of all Bones, and of the Junctures of the Hand and Foot, are groſſer than in the middle, becauſe in the extremities there muſt be great Ligaments for the ſtrength of the junctures, and in

the middle they are ſmall, that they might give place to the Bodies of the Muſcles, which muſt neceſſarily be many and great, for their many ſhaped motion.

After the Bones of the Arm are the Bones *Raſettæ*, or *Carpi*, which are eight, for the multitude of motions, & alſo for other cauſe.

Afterward is the little Hand, whoſe inner part without the Fingers is called *Vola*, and *Palma*, but its outward part is without a name (witneſs *Ariſtotle primo de Hiſtor.*) Its Bones are four correſpondent to the other Fingers, (the Thumb excepted) from which is compounded the *Pecten* of the hand, and the *Procarpum*, or *Procarpium*, and *Antecarpum*, and *Metacarpum*, yet there are ſome that would that the firſt Bone of the Thumb ſhould bee in the *Raſeta*, and as ſo, the Thumb hath not but two bones; ſome ſay, that the firſt Bone of the Thumb is in the *Pecten* of the hand.

After the *Pecten* are the Fingers; Firſt is *Pollex* the Thumb, which

hath

hath two bones out of the *Vola*; after that is *Index*, or the pointing Finger next unto it; next to which is *Medius* the middle Finger, longer than the reſt; afterward is the Finger called *Medicus*, and *Annularis*, the Phyſicians, and Ring-finger; after that is the leaſt, named *Auricularis*; theſe four have three junctures, and three Bones; and alſo the Thumb in my opinion hath three junctures, and three bones, becauſe I doe not place the firſt bone ſerving it, neither in the *Raſeta*, nor in the *Pecten*.

In the inner part of the Fingers there is notable fleſh, which is a coverlet to the Bones, leſt they ſhould bee hurt in their continual meetings of hard things, which they neceſſarily touch in the operations of the hands; but in the ſides of them is leſs fleſh, and leſs in the outward part, becauſe in thoſe parts they doe not meet with things hurting them in their operations, as within the hand.

The Chords of thoſe Fingers, eſpecially the outermoſt, doe enter

ter into their juncture above; and every Finger hath a Chord, of which ſpeech is not made for the preſent, becauſe their Muſcles cannot bee ſeen, whereof ſome are deep placed in the arm, and ſome Chords come to the Fingers from the Neck, as wee have more largely ſpoke of the Ring-finger in our Commentaries upon *Mundinus*.

Therefore in the great Hand there are thirty one Bones (the Bones *Siſamiis* excepted) which fill up ſome junctures; and firſt is the Bone *Spatula*, afterwards the Bone *Adjutorium*, after the two *ſociles* of the arm, and eight of the *Raſeta*, and four of the *Pecten*, and fifteen of the Fingers.

In the end of the bones of the Fingers are the Nayls, whoſe helps are for the comlineſs of the hand, and for the defence of the end of the fingers, and to take up ſmall things; and the Nayls are engendred of ſuperfluities, as alſo the Hairs, therefore they doe continually encreaſe, yea in a dead

man.

man. From the aforesaid things doth appear the substance of the hands; their situation, number, shape, and Colligancy, and their quantity lye open; their complexion is such as are their parts; their helps cannot bee described, for they are the Organes of Organes; they suffer passions of all sorts.

Of the Anatomy of the Feet.

THe Hands being seen, see likewise the Feet, at least one, which is enough in that dissection, as also one hand; the Foot therefore is divided into great and small, as also the Hand, witness *Haly* and *Galen*; and the Foot, witness *Haly*, hath four parts, the first part is called *Ancha*, the Hip; the second *Coxa*, the Thigh; the third *Crus*, the Shank; the fourth *Pes parvus*, the little Foot.

And first, the skin of it is to bee excoriated every where from the top to the bottom; in the inward part of which under the skin, is one notable branch of the Vein

Pes Lati. a Grꝛ. πῶς παρὰ τὸ πεπάυθαι ἀπὸ τοῦ ὅλου σώματος. *Quasi in ipso à toto corpore cessatum sit Aristotele.*

Chilis

Chilis, descending from the *Inguen* by the Thigh, which when it is under the Hamme (as wee have said above) is divided into three parts; one doth descend directly by the inside unto the innermost hollowness of the Foot, and this is called *Saphena*, which is cut in divers diseases.

One other is obliquated toward the outside by the calf of the Leg, and descendeth to the forein or outermost hollowness, and this is called *Sciatica*, or *Scia*, which being cut availeth for the pain of the Hip; and the bifurcation of this *Mundinus* knew not, neither his followers; and it may be that this branch doth avail for the pain of the *Sciatica*, because some of its branches are united with the branches of the Veins nourishing the Muscles, and the outward part of the Hip toward the juncture of the *Scia*.

Between those branches in the *Raseta* of the Foot, are Veins common to both the aforesaid branches; which sometimes are

cut,

Place this figure betweene 364 and 365. pages

cut, especially if the other of those two aforesaid may not be found; which hapneth often, because as it appeared above, the Veins doe not keep the same situation, nor number, nor also quantity.

Between the aforesaid *Saphena*, and also the *Sciatica*, under the Hamme, even unto the little Foot, there doth descend one notable branch, which keepeth the middle between these, which may be cut in place of the deficiency of the other aforesaid; in the Figures under written, you shall see the aforesaid Veins, at least the *Saphena*, and the *Sciatica*.

Here followeth the Figures of the Veins of the Feet.

IN these three Figures you have all the Veins used to bee flebotomised in the Feet, and in that Figure which is in the middle you see how one Vein bigge enough coming from the inner part of the Hippe goeth overthwart, descending, and under the Hamme is divided

vided into two Forks, one branch of which goeth by the inner part of the Foot, or Shank, even unto the little Foot, which is called *Saphena*.

But another Branch goeth by the outer part of the Foot, which is called *Scia*, and those branches as well inward as outward, are seen in the Figures on the sides, which are flebotomised about the anckles, or about the toes of the Feet.

The Veins of the Foot being seen, the Muscles are to be removed wholly from the bones; as also it is done in the Section of the Hand, for the same cause, noting that glandulous flesh about the *Inguen*, which is the emunctory of the Liver, about which doth pass one aforesaid branch of the Vein *Chilis* descending, from which the *Saphena*, and the *Sciatica* Vein are made; and in that flesh the matters over-flowing to the Liver are drunk in, as we have said in another place.

The Muscles being removed, the

the Bones of the Foot doe remain, of which that which doth first occur, from the upper parts, is called *Os Anchæ*, which Bone is on either side one; these two Bones are in the hinder part most firmly united to the *Os Sacrum*, or to the bones *Alhovius*; but in the *Pecten* they joyn themselves togeter, and these two Bones as well before as behind, are (by Gods appointment) opened in Births; and these Bones are more crooked and large in a Woman than in a Man, for the Birth; and these Bones have four names, before they are called *Ossa Pectinis*, *Penis*, *Pubis*, and *Femoris*; and on the hinder part they are called *Ossa Anchæ*, and on the top and before they are called *Ossa Ilii*, and *Alhartha-pha*, and below in the place in which there is a hollowness, it is called *Pixis*, into which doth enter the head of the *Os Coxæ*, which is round on the top, called *Vertebrum*; they are called *Ossa Sciæ*, and *Acceptabulum*.

To those two Bones *Ancharum*

in

in the hinder part doe adhere the Buttocks called *Nates à nitendo*, of being neat and comly, and *Seſſus à ſedendo*, of ſitting; in thoſe parts the fleſh is thicker than in other members, leſt preſſing upon it, the ſoft of the body ſhould bee preſſed with Bones; and thoſe parts (according to ſome) have Colligancy with the whole, therefore they ſay, that *Ventoſes* and Horſe-leeches applied there are inſtead of flebotomy; and they are dull of ſenſe, becauſe they are little Nervous; and among other helps they doe perform reſt to the body by ſitting; they doe alſo defend the *Anus* from cold; and they are for comlineſs, by hiding the place of excrements.

After that Bone or Bones of *Ancha*, doth follow the *Os Coxæ*, being a long concave within, and convex without, and more groſs than any other Bone of the body; hollow, that it might be light, in which there is marrow, as alſo in other great Bones; and the juncture between that

Bone

Bone and the *Os Ancha* is called *Scia*; that Bone hath two Additaments above, and two below, but those above are greater, one whereof doth enter into the aforesaid *Pixis* of the *Os Anchæ*, in the center of which, besides other Ligaments, it is most firmly united with one ligament, Chordy, round, and hard, lest it should bee easily dislocated.

And their lower additaments are joyned with the two *Fociles* of the Shank, in the former part of which there is a smooth round bone called *Rotula*, and all these bones are fastned together very firmly by Ligaments, and this Juncture is called *Genu* the Knee, whose hinder part is called *Poples* the Ham.

From the Knee to the little Foot is the Legge, whose former part is called *Crea*, and the hinder part *Sura*, in that part are the two aforesaid Bones which are called *Focilia*, *Arundines*, *Colla*, *Tibiæ*, and *Cannæ*; those two *Fociles* doe differ in quantity, for the bone placed in the inner part, is longer,

and more groſs than that which is placed in the further; and the leſſer is not joyned with the bone of the Hip, but cleaveth to the great *Focile* below the Knee, that it might ſtrengthen it, and that it might keep it ſtraight.

Thoſe two *Fociles* toward the bottom, are terminated to one Bone of the little Foot, which is groſs enough, named of *Avicen Os Cahab*, at the ſides whereof the two aforeſaid *Fociles* doe make that eminence on either ſide which are called *Caville* the Ankles; and of all theſe is ordained the greater of the junctures of the little Foot.

The Foot alſo hath a concavity below, and a convex part above, which is called *Mons*, and *Altum pedis*; and the whole Foot is compounded of many bones, whereof that which firſt occurreth is the aforeſaid *Os Cahab*, under which is *Os Calcanei* the Heel-bone, which as one ſtands is declining toward the bottom; before the *Os Cahab* is one Bone called *Navicular*, after

ter

ter that four Bones of the *Raſeta*, to which toward the out-ſide is united one Bone of the *Siſaminum*, after that five Bones of the *Pecten* of the Foot; then are fourteen bones of the Toes; in the middle juncture of the great Toe are ſeen alſo two Bones, *Siſamia*, or *Siſamina*, ſo called becauſe they are like to the graines of *Siſamum*.

And the Chords extending the Toes begin in the Shin, and thoſe contracting them are in the ſole of the Foot, which Chords with their Muſcles cannot well be ſeen but in bodies conſumed in the water, or dried in the Sun.

In the extremity of the bones of the Toes are alſo the Nayls, the helps of whom are thoſe which are in the Hands, this excepted, that they are not for the taking up of ſmall matters.

From the things done before is to be ſeen the ſubſtance of the Feet, in which alſo are Cartilages, *Albaguahic*, and Arteries, as in the hands; their ſituation, ſhape, quantity, Colligancy, and number appear;

pear; their complexion is such as is the complexion of Organical members; their helps are to change the place, and to carry the upper parts to the will of the Soul as far as they can: they suffer passions of all sorts; the Figures of the Muscles and of the Bones doe follow.

The first Figure of Muscles.

THis is a Figure which resembleth a Man flead from the skin, in which are seen the shapes of the outward Muscles of the former part of a man, by which Physicians are helped in knowing the Heads, and also the middle parts of the Muscles, that thereby they might the better know to Prognosticate of Wounds, Ulcers, and Apostumes, and that also they might know to make the incision of Ulcers, and of Wounds, and other Chirurgical operations, without the hurt of the Chords, which are the heads of the aforesaid Muscles.

place these .4. figures be=

tweene .372. and .373. Pages

The second Figure of Muscles.

IN this Figure are seen the outward Muscles on the sides of a mans body, from which Physicians are made cautious in Prognosticating Apostumes, Ulcers, and Wounds, and in Incision, and in other Chirurgical operations.

The third Figure of Muscles.

THis is a Figure in which are seen all the Muscles behind, placed immediately under the skin, which doth perform the aforesaid helps to Physicians, and those Figures doe also help Painters in the drawing of members.

The first Figure of Bones.

IN this Figure are seen the forms, and situations, and also the true number of all the Bones of a mans body, except the bones of the head, and also the bones of the back; all the junctures of which cannot bee

seen, unless in bodies boyled, or dried in Church-yards.

The second Figure of Bones.

IN this Figure are seen the bones of the hinder part of a man; there are also seen two Skuls, in the right of which is seen the Coronal Commissure which is in the upper part, & the *Sagittalis* is seen which is in the middle, the Commissure of *Lauda* is also seen, which is in the lower part on the sides; there are also seen the two Commissures named of me above in the Anatomy of the *Craneum*, which are above the Commissures *Squamosas* being neer the Ears, but they are almost not to bee perceived; on the left side is another Skull, in which are seen the Mandibles, and part of the Coronal Commissure, and two Commissures below, the *Sagittalis* being on one side, and there is seen one bone of the two *Ossa Paris* which is from the region of the Eye, or from the Bone called *Domum Faciei*, reaching

place these. 2. figures betweene pages. 374. and. 375.

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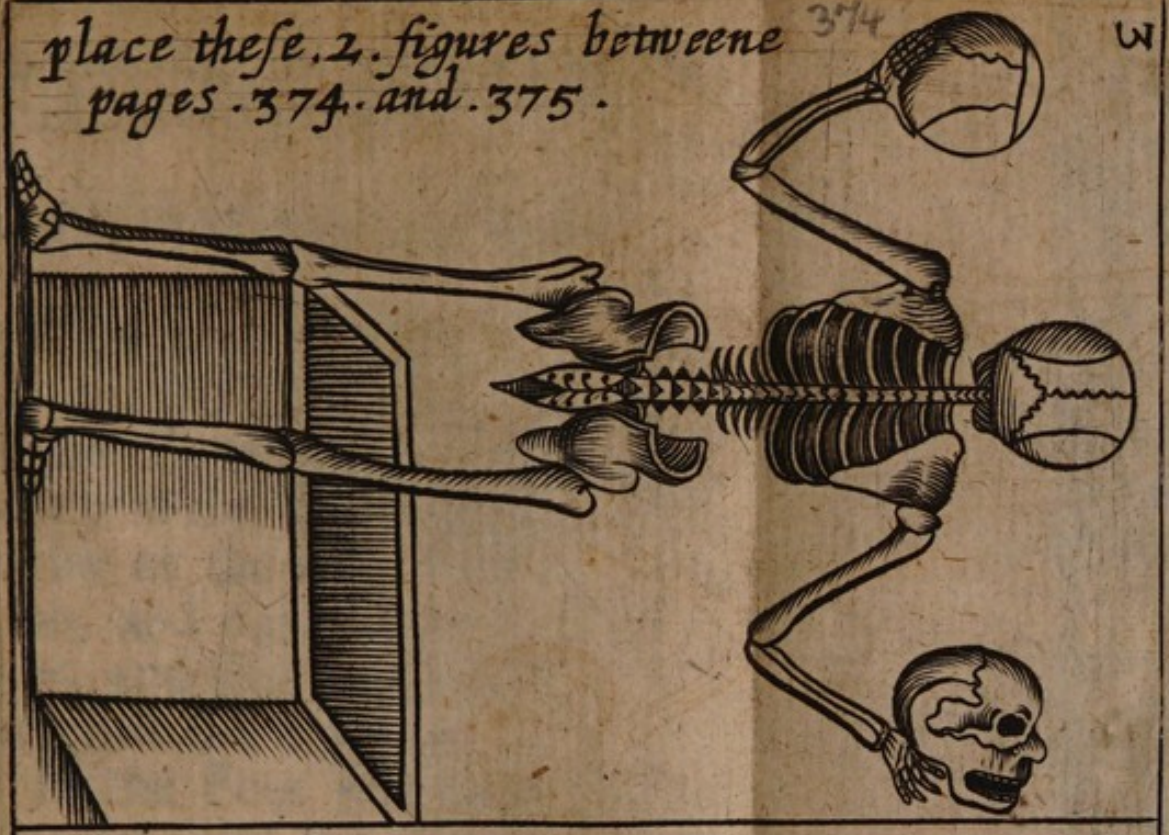
3



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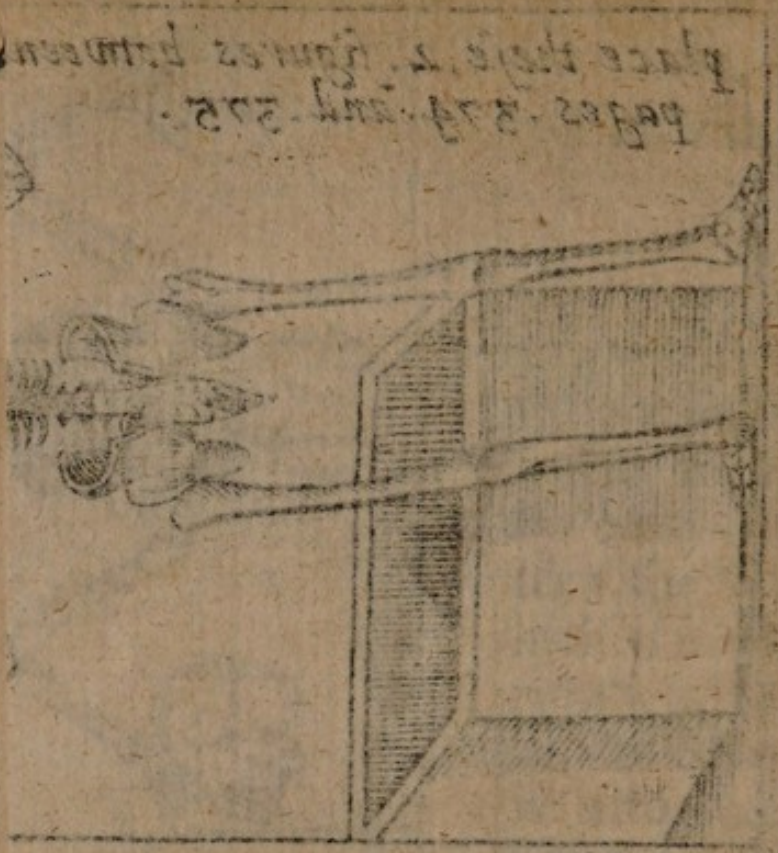

ing through the breadth of the Head toward the Ear.

The third Figure of Bones.

YOu have in this Figure the number, ſhape, and ſituation of the Bones of the Hand and Foot; in the Hand are the extremities of the two *Fociles* of the Arm, and eight Bones of the *Raſetta*, and four of the *Pecten*, and fifteen of the Fingers.

In the Foot you have the *Os Calcanei*, and the *Os Cahab*, and *Os Navienlare*, and four bones of the *Raſetta*, and five Bones of the *Pecten*, and fourteen Bones of the Toes.

Theſe are thoſe things which for the preſent wee have given to our Scholars for common Anatomy, for the end whereof let him be praiſed which is three and one, whom I moſt humbly entreat that hee may direct mee to greater matters. *Amen.*

And hee which is not content with theſe, let him have recourſe

to

to our most wholsome Commentaries upon *Mundinus*. Fare yee well in the Lord, yee which gather the Flowers of our Art after the manner of Bees; for wee doe reject the outragious Reader, the rest wee entreat and reverence: once more farewell.

FINIS.

END