

# EIGHTH BOOK.

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## CHAPTER I.

### OF THE SITUATION AND FIGURE OF THE BONES OF THE HUMAN BODY.

It now remains, that I speak of what relates to the bones; for the easier understanding of which, I shall first describe their situations and forms. The first then is the skull, which is concave on the internal side, externally gibbous, and on each side smooth, both where it covers the membrane of the brain, and where itself is covered by the skin, from which the hair grows. In the occiput and temples it is simple; but double from the forehead to the vertex. And the bones of it in their external part are hard; on the inside, where they are connected with each other, softer. And veins are distributed between them, which probably supply them with nourishment.

Now, the skull is rarely entire without sutures; but in hot countries it is more frequently found so. And such a head is strongest, and the most safe from pain; of others, the fewer sutures there are, so much the freer is the head from complaints; for their number is not certain, nor indeed their situation. However, for the most part, two above the ears divide the temples from the upper part of the head; the third, running to each side through the vertex, separates the occiput from the top of the head; the fourth goes from the vertex along the middle of the head to the forehead; and this ends in some at the point to which the hair extends, in others between the eye-brows, dividing the forehead itself.\* The other sutures are exactly fitted to each other upon the same level. But the transverse ones

\* Morgagni (Ep. iv. cap. 91), with Paaw, thinks it probable, that there is some chasm in the text, because Celsus does not describe the coronal suture, which he could not be ignorant of.

above the ears, grow gradually thinner to their edges; and thus the inferior bones slightly overtop the superior ones. The bone behind the ear is the thickest in the head; for which reason probably hair does not grow there. Over these muscles too,\* that cover the temples, a bone is situated in the middle, which is inclined to the external part. But the face has the largest suture; which, beginning from the one temple, runs transversely through the middle of the eyes and the nose, to the other temple; from which two short ones point downward under the internal angles. The cheek-bones also have each of them a transverse suture in the upper part. And from the middle of the nose, or the sockets of the upper teeth, proceeds one through the middle of the palate; and another also divides the palate transversely. These then are the sutures found in most people.

The largest foramina of the head are those of the eyes; next the foramina of the nose; then those we have at the ears. The foramina of the eyes run straight and undivided to the brain. Two foramina are observed in the nose, divided by a bone in the middle; for these, about the eye-brows and angles of the eyes, begin osseous, and so proceed near the third part of the way; then turning cartilaginous, the nearer they approach to the mouth, so much the softer and more fleshy they become. But these foramina, which from the beginning of the nostrils to the internal part are simple, are there again divided each into two courses; the branches opening into the fauces both emit and

\* *Super hos quoque musculos, qui tempora contegunt, os medium, in exteriorem partem inclinatum, positum est.*] Thus Linden and Almeloveen. All the other copies have, *sub his musculis, qui tempora connectunt*; in the following words they differ, which Ronsseus would read thus, *os medium in interiorem partem inclinatum*; in this he was followed by Paaw, who was of opinion, that Celsus intended here the *processus petrosus*, which Morgagni thinks quite foreign to the question. It is probable, says the same author, that Linden changed *sub his musculis* into *super hos musculos*, to make the description answer to the *processus zygomaticus*, which our author describes a little after under the name of *jugale*. His own conjecture is, that Celsus wrote *sub his musculis, qui tempora continent*, and that he meant that part of the temporal bone, which is covered by the crotaphite muscle. *Morgag. ep. vii. p. 212. 214.* But as this description of a bone is inserted in the midst of the sutures, there is some foundation to suspect the whole to be an interpolation.

receive the breath ; the others go to the brain ; in the end they are branched into many small openings, which afford the sense of smelling. In the ear, too, the passage at first is straight and simple, but farther in it becomes winding ; the part next the brain is separated into many and small openings, from which we have the faculty of hearing. Near these there are, as it were, two small sinuses ; and above them, that bone terminates, which, going in a transverse direction from the cheeks, is sustained by the inferior bones. It may be called jugale from the same resemblance, which gave it the Greek name of zygoδες (ζυγωδες). The maxilla is a soft bone,\* and only one in number ; the middle and lowest part of which compose the chin ; from whence it proceeds on both sides to the temples ; and this only moves : for the malæ with the whole bone, that contains the upper teeth, are immoveable ; but the extremities of the maxilla shoot, as it were, into two horns. One of these processes is broader below, † and is narrowed at the vertex, and being extended forward, enters below the os jugale, and over that is tied down by the muscles of the temples. The other is shorter and rounder, and is lodged like a hinge in that cavity, which is near the foramina of the ear ; and there, turning itself different ways, gives the maxilla a power of moving.

The teeth are harder than bone ; part of them are fixed in the lower jaw-bone, and part in the upper. The four first, from their cutting, are by the Greeks called tomici (τομικοί). On each side of these, above and below, stand the four canine teeth ; beyond which there are commonly five maxillary teeth, except in those in whom the genuine (*dentes sapientiæ*) which generally grow late, have not come out. The fore teeth adhere each by one root,

\* *Maxilla vero est molle os.*] Thus all the editions read, but Morgagni (Ep. vii. p. 211.) suspects *molle* should be *mobile*, a moveable bone ; for Celsus himself calls the sternum a strong and hard bone, which is not to be compared in that respect with the maxilla. It is no objection to this reading, that the author adds, *solaque ea movetur*, for that is to exclude the upper jaw-bone. The reader will please to observe, that maxilla by our author is applied only to the lower jaw-bone, for he includes the upper jaw-bones under the malæ.

† I have here followed the proposed emendation of Morgagni, *infra* for *intra*. Ep. i. p. 40.

the maxillary by two at least, some by three or four. And a longer root commonly emits a shorter tooth; and the root of a straight tooth is straight, that of a crooked one bent. From this root in children, a new tooth springs, which most frequently forces out the former; sometimes, however, it appears above or below it.

Next to the head is the spine, which consists of twenty-four vertebræ. There are seven in the neck, twelve by the ribs, and the other five are below the ribs. These are round and short, and send out two processes on each side; in the middle they are perforated, where the spinal marrow, connected with the brain, descends. The sides also between the two processes are perforated by small holes, through which, from the membrane of the brain, similar small membranes proceed. And all the vertebræ\* (except the three uppermost), and the superior part in the processes themselves, have small depressions; at the lower, on the contrary, they send out processes pointing downwards. The first then immediately sustains the head, by receiving small processes of it into two depressions; which is the reason that the surface of the head below is rendered unequal by two prominences.

\* What follows, relating to the structure and connection of the vertebræ, appears to be very much corrupted, insomuch, that the reading in all the copies makes our author contradict himself. I shall be content with mentioning some observations of Morgagni's upon the reading of Linden. The words in the parenthesis (says he) *exceptis tribus summis, except the three uppermost*, were surely never written by Celsus, at least not as they stand; for if the three first vertebræ want depressions in their superior surfaces, how comes the first to receive into its depressions the two small processes of the head, as our author immediately adds?

The adding of *parvis* to *tuberibus* he judges to be superfluous, because Celsus had said just before, *exiguus ejus processibus*. He conjectures that *secunda superioris parti inferiori inseritur* is interpolated, because the connection is more natural without these words. A little after follows *tertiam eodem modo secundam excipit*, as if a process stood out from the inferior part of the second vertebra to be surrounded by the third in the same manner, that its *processus dentatus* is surrounded by the first; so that all these five words he seems with justice inclined to expunge.

After these Linden adds, *Jamque vertebra tertia tubercula, quæ inferiori inserantur, excipit*; which, at first view, must appear highly absurd. I, therefore, have followed, in the translation, the reading of Nicolaus, Pachel, Pinzi, Stephens, and Morgagni's manuscript, *excipit* for *excipit*. See Morgagni, ep. vii. from 173 to 177.

The second is inserted into the under part of the first, and the superior part of the second is round and narrow (*processus dentatus*), in order to admit of a circular motion, so that the first surrounding the second, allows the head to move towards each side. The third receives the second in the same manner; whence the neck has great facility of motion. And indeed it would not be able to sustain the head, if straight and strong nerves on each side did not secure the neck, these the Greeks call *carotæ*. For one of them in every flexure, being always stretched, prevents the upper parts from slipping further. The third vertebra has prominences, which are inserted into that below it. All the rest are inserted each into its inferior one by processes pointing downwards; and by depressions, which they have on each side, they receive the superior, and are secured by many ligaments, and a great quantity of cartilage. And thus one moderate flexure forward being allowed, a man both stands erect for some kinds of employment, and at other times bends himself, as the actions he is engaged in require.

Below the neck, the first rib is situated opposite to the shoulders. After that the six inferior ones\* reach the bottom of the breast; and these at their origin being round, and furnished with something like small heads, are fixed to the transverse processes of the *vertebræ*, which are in that part a little depressed; then they grow broader, and bending outward, degenerate gradually into a cartilage; and in that part being again turned gently inward, are joined to the pectoral bone; which begins strong and hard at the fauces, being excavated on each side, and terminates at the *præcordia*, where it is softened into a cartilage. And under the superior ribs there are five, which the Greeks call *nothæ* (*spurious*), shorter, and thinner, which also gradually turn to cartilage; and adhere to the external parts of the abdomen; the

\* *Almeloveen* and *Linden* read here *septem inferiores*, others write *undecim*, as if the following description related to all the ribs. But that is false, as appears by the sequel, and it is plain, from the whole passage, our author could write nothing else than *sex*.

[*Targa* says, "I read *six*; for the number *vi.*, which is correct, could, in transcribing, easily become corrupted into *xi.*"]—G. F.

lowest of these, in the greatest part of it, is nothing else but a cartilage.

From the neck two broad bones, one on either side, go to the shoulders, by us called *scutula aperta*, by the Greeks *omoplatæ*. These have cavities at their vertices; from the vertices they become triangular, and growing gradually broader tend to the spine; and the broader they are in any part, so much the duller is their sensation. These two at their extremity are cartilaginous, and in their back part lie as it were loose, because, unless at the top, they are fixed to no bone, but are there tied down by strong muscles and nerves.

But at the first rib\* a little within the middle of it, a bone grows out, in that part indeed slender, but going forward; the nearer it comes to the broad bone of the scapula, it becomes thicker, and broader, bending a little inwards, which, being a little enlarged at its other vertex, sustains the clavicle. This bone is crooked, and is to be reckoned amongst the hardest bones; the one end of it is joined to the bone I just mentioned before, and by the other it is fixed in a small depression of the pectoral bone, and is moved a little in the motion of the arm; and its lower head is connected, by ligaments and a cartilage, with the broad bone of the shoulders.

Here the humerus begins, which, at both its ends, is enlarged, soft, without marrow, and cartilaginous; in the middle round and hard, and containing marrow; is a little concave† in its fore and

\* This whole paragraph is extremely obscure. The variation of reading in the older copies does not in the least lessen the difficulty. If we were allowed to understand by *jugulum*, the neck, the whole description, lame as it is, could then answer no bone but the *clavicle*; but *jugulum*, in no other place of this work, seems to be used for anything else but the *clavicle*, so that *id ipsum*, &c., would appear to be the beginning of the description of that bone. Morgagni thinks, that though the description is far from just, yet that most of the words, as they now stand, relate to the *spine of the scapula*, which may be said to sustain the clavicle; and it is observable, that if our author does not intend the *spina scapulæ* here, he makes no mention of it at all.—*Vide Morgagni*, ep. vii. p. 177. I must own the reading appears to me so much depraved, that it is impossible to determine precisely, what our author has had in view.

† This translation Linden and Almeloveen follow. In all other copies the

internal part; and convex in its posterior and external part. Now, the fore part is next the breast; the posterior is toward the scapulæ; the internal next the side; and the external at the greatest distance from the side; which distinctions will afterwards appear applicable to all joints in the extremities. The upper end of the humerus is rounder than the other bones, which I have yet mentioned, and a small part of it is inserted into the vertex of the broad bone of the shoulder; the greatest part, standing out of it, is secured by ligaments. But the inferior head has two processes; the intermediate space between which is even more depressed than its extremities.

This affords a reception to the fore-arm; which consists of two bones. The radius, which the Greeks call *cercis* (*κερκις*), is the superior one and shorter, and at first being more slender, with its ends round, and a little concave, receives the small tubercle of the humerus, which is secured there by ligaments and a cartilage. The cubitus is the inferior and longer, it is at first larger in its upper end, and by two vertices, as it were, standing out, fixes itself into the sinus of the humerus, which I mentioned between its two processes. The two bones of the fore arm at first\* are close together, then separate by degrees, and meet again at the hand, their former proportions being reversed; for there the radius is pretty large, and the cubitus very small. After that, the radius rising to a cartilaginous head, is inserted into its neck. The cubitus is round at its extremity, and projects a little on one part. And to save frequent repetition, this ought to be known, that

reading is *leniter gibbus, et in priorem et posteriorem, interiorem et exterio-rem partem*, as if the bone were concave on no side. Morgagni (ep. vii. p. 216.), therefore, proposes a reading agreeable to truth. *Leniter gibbus in priorem et posteriorem et interiorem, cavus in exteriorem; i. e.* gently convex in its fore, and posterior, and internal part; concave externally.

\* The reading in Linden and Almeloveen is *primo vero duo radii et brachii ossa, etc.* which at once appears to be wrong, because Celsus had said before, *quæ res sedem brachio præstat, quod constat ex duobus ossibus*, to which two he immediately gives the names of radius and cubitus; so that it would be sufficient, as Morgagni observes, to have written *duo brachii ossa*, or if they must be named, *duo radii et cubiti ossa*, according to the first of which I have translated. The other editions have *primo vero duobus radiis brachii ossa*. See Morgagni, Ep. i. p. 28.

# END OF SAMPLE TEXT



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