

put into the Hole made in the Middle of the External Bone of the first Rank of the *Carpus*, was continued with the rest through the Bones of the second Rank to those of the *Metacarpus*, where they run from one Extremity to another; that is to say, the outer Part of the folded Wire from the *Cubitus*, did run down the Outside of the External Bones of the first and second Rank of the *Carpus*, to the External Bone of the *Metacarpus*, all along, till it was brought out at the Extremity of the furthest Bone of the Toe belonging thereto; and the inner Part of the same Wire passing from the *Cubitus* through the same two Bones of the *Carpus*, ran down to the third Bone of the *Metacarpus*, from the Outside, from whence 'twas convey'd to the Extremity of it's Toe, and there riveted. The third Wire pass'd from it's Entry, in the Middle of the external Bone of the first Rank of the *Carpus*, to that of the second, and from thence down to the second Bone of the *Metacarpus*, from the Outside, to the Extremity of the Toe, where it was fasten'd; and the folded Wire from the back-part of the *Radius* pass'd down at two Places through the middle Bone of the first Rank of the *Carpus*, to that of the second Rank, and from thence to the fourth and fifth Bones of the *Metacarpus*, from the Outside, and still forward to the Extremities of their Toes, where they were fix'd. This done, I caus'd to be perforated the External Bones of the *Carpus* twice, *i. e.* toward their fore and back-part, as also the *Metacarpus* at the upper and lower Extremity; passing the Drills from the Outside to the inner of each Bone, or from the Right to the Left, by which the Bones above were as well join'd with their Sides, as with those below them, so that each was kept secure in it's Place, especially the Bones of the *Metacarpus*, which would have too readily separated from each other, and endanger'd the breaking the Wires, by which they were join'd with those above. Since the third Bone of the first Rank of the *Carpus* lies, as it were, at the Side of both Ranks, therefore I thought it convenient to pass the two Extremities of the Wire, which run from the Right to the Left, in the first Rank, that so it might be fasten'd with it's Partner on the Inside; and since the Internal Bone of the *Metacarpus* yet remain'd to be join'd, this inner Bone of the *Carpus* was again perforated, and a Wire brought from it to the inner Bone of the Bone of the second Rank, and from thence to the said Bone of the *Metacarpus* with it's Toe, where it was fasten'd.

Connexion of
the Femur.

The upper *Epiphysis* of the *Femur* having also been separated by Boiling, it was requisite to perforate it's Head four times, for the Immission of two folded Wires, which were brought obliquely down the inner and outer Side to it's Neck, where their Extremities were twisted and secured. Afterward it was perforated in the Middle four times, for two other folded Wires, which were once or twice twisted, and their Extremities put through the aforesaid Holes to the inner and outer Part of the Neck of the *Femur*, as before, there to be made fast. The *Acetabulum* was perforated in the Bottom, and these two Foldings pass'd

pass'd thro' it; whereinto was put a Pin, at the back-part of the *Ossa Innominata*, to be pull'd out at Pleasure, and the Thigh suspended as the *Humerus*.

Two folded and twisted Wires pass'd in at the *Epiphysis*, on each Side of the *Spina*, in the Middle of the *Tibia*, and their Extremities brought out at it's upper and back-part, where they were riveted: Afterward the lower *Epiphysis* at the *Femur* was perforated from the Right to the Left, and a Pin passed from the Outside, through the Foldings of the Wires from the *Tibia*, to the Inside, (whereby the Flexion and Extension is most conveniently shewn) to be taken out at Pleasure. The *Perone* was fix'd to the *Tibia*, at the upper Part, by a Pin obliquely upward from the one to the other; and the *Patella* fasten'd to the fore-part of the *Femur*, by a Pin passing directly inward from before to behind.

Of the Tibia
and Fibula.

The lower Part of the *Perone* forming the External *Malleolus*, is perforated from without to within, as is the opposite Part of the *Tibia* forming the Internal one; likewise the *Astragalus* is perforated from the Right to the Left, corresponding to these two Holes, for the Immision of a Pin, whereby the Foot is join'd to the *Tibia*, to be pull'd out at Pleasure. The *Astragalus* is join'd to the *Talus* by a Pin, pass'd from the upper and middle Part of the one, to the lower Part of the other, where it is riveted. The *Astragalus* is thrice perforated before; into two of which Holes a folded Wire is pass'd, which goes forward through the *Os Naviculare* to the Bones of the *Metacarpus* of the second and third Toe from the Inside, at whose Extremities they are fix'd. The third Wire runs from the *Astragalus* to the *Os Naviculare*, and the third *Os Cuneiforme* to the fourth Toe. The said *Os Naviculare* is perforated on the Inside for a Wire, which runs through the Bone of the *Metacarpus* and inner Toe. The third *Os Cuneiforme* is perforated for a Wire which passes through the Bone of the *Metacarpus* and outer Toe. The three *Ossa Cuneiformia* are join'd to each other by a folded Wire, which runs twice from their Outside to the Inside, where they are secured.

Of the Hind
Foot.

As to the Structure of the Bones, the Design of preserving the Skeleton entire, gave me no Liberty to go any further than their External Surface, so it cannot be expected I could dive any deeper in the Knowledge of them. *Tentzelius* says, *Omnia isthæc Ossa porosa sunt & rimosa*; and I may add, *levia* too: For there is nothing about them to be seen of that Solidity and Compactness, that Smoothness of Surface, and Whiteness, which is observable in other Quadrupeds of the larger Size, such as Oxen, Horses, Harts, &c. And I should have readily attributed this to the Youth of the Animal, had not *Tentzelius* from his Subject, suppos'd to be 200 Years old, told the same. And this differs much from the Account of the *Behemoth* in *Job*, whose Bones are said to be as strong Pieces of Brass, and Bars of Iron. The *Laminae* of the Head were thin and solid; the External Table thin and

more

more ponderous ; the Teeth exceeding solid and ponderous : So that from the Computation of the Weight of the upper-part, which was taken off by the Saw, as in *Fig. 66* and *67*, which is only 6 lb Weight, may reckon all the Head, which weighs 66 lb beside the Teeth, not to weigh above 24 lb at most ; which well agrees with what *Tentzelius* says, that each of the *Dentes Molares* were 12 lb Weight, and that of all the 45 lb which the lower Jaw weighs, the rest of the Bone beside the Grinders do not exceed 12 or 16 lb. For it's External Surface seems to be both porous and rimous, as is said ; and at perforating the *Condyles* seem'd to be very spongy, as were the *Ribs*, *Femur*, *Tibia*, &c. where, after the Drill had pass'd the External *Lamina*, which was very thin, it would have run forward, as if it had been through so much Moss. When the *Epiphysis* came off the Thigh-bone, it resembled very much the *Epiphysis* of the *Femur* in Man ; it's minute *Cellules* were not so big as those of an Ox, and the *Laminae* which circumscrib'd them, not by much so solid. The *Humerus* indeed both above and below was much harder ; it did heat the Drill in passing : And there may be some Reason for that too ; *viz.* that since the Progression of most Quadrupeds chiefly depends upon a more frequent Motion of the Fore than Hind Limbs, it does much more here, where the Head is proportionably more heavy than in other Animals. And this perhaps is the Reason too, why the Fore-limbs in this Animal are brought so far forward ; for measuring in a straight Line from the *Humerus* above to the *Carpus* below, and bringing another Line directly backward at the Articulation betwixt the *Humerus* and *Cubitus*, from the perpendicular Line before, to the Point of the *Olecranon* behind, it was 20 Inches ; which is the Reason why some think the Engraver has made the fore Limbs of the Skeleton to bend too much at the Articulation. The Bones of the *Carpus* are pretty solid, and by Perforation they seem only to have a little Spongiosity about the Middle : All the rest of the Bones of the Fore-foot are spongy. The *Astragalus*, *Os Naviculare*, and *Ossa Cuneiformia*, are more solid ; but the *Talus* and other Bones of the Hind-Foot spongy. The Spine was spongy, as is usual ; the *Ossa Innominata* of a Middle Consistence ; and the *Scapula* very thin, but solid toward it's Neck. I cannot positively determine the Cavities for the Marrow, nor Quantity of it ; but by comparing the Dimensions with the Weight and small Quantity of Fat to be seen at the Boiling, we may suppose it not to have been much in this Animal : I know not how it may be in others of this Species.

I must not omit observing, that when I weighed the Bones, it was immediately before they were joined ; so that their Weight was much diminish'd, in respect of what it was when they were newly boil'd. The Weight is 316. to 1 lb and the Measure, according to the *English* Yard, 12 Inches to a Foot, and 12 Lines to an Inch.

Fig. 60. Represents the stuff'd Skin of the Elephant, as it now stands in Fig. 60. the Hall at Dundee, with an Account of it's particular Dimensions.

	Feet	Inch.
A, A, The Height of the <i>Elephant</i> at the Fore Feet.	8	6
B, B, It's Height at the Hind Feet.	9	
C, C, It's Length.	10	
C, D, The Length of the Tail.	4	3
E, E, The Circumference of the Belly.	14	
F, F, From the top of the Head to the Point of the <i>Proboscis</i> .	8	
G, F, The Length of the <i>Proboscis</i> .	4	6
H, H, The Distance between the Forehead and lower Jaw.	2	3
F, I, From the top of the Head to the lower Jaw.	4	6
K, K, The Length of the Ear.	1	7
L, L, It's Breadth.	1	5
M, The Orifice of the <i>Meatus Auditorius</i> .		
N, N, The Circumference of the Fore-foot round the Hoofs.	3	10 $\frac{1}{2}$
a, The Fore-hoof Fore-shorten'd.		5
b, The middle External Hoof.		5
c, The third External Hoof.		4
Note, That neither the Diameter of the Fore-foot from before to behind, which was —	1	4 $\frac{1}{2}$
nor from the right to the left, which was —	1	2
can be so here.		
O, O, The Circumference of the Fore-foot at the upper Joint.	4	3
P, P, At the Articulation with the <i>Carpus</i> .	2	6 $\frac{1}{2}$
Q, Q, The Circumference of the hind Foot round the Hoofs.	3	4
The Diameter from before to behind		
From the right to the left.		
a, The Breadth of the fore Hoof.		3
b, The Breadth of the outer Hoof.		4
c, The Breadth of the third Hoof.		4
R, R. The Circumference of the hind Leg.	2	2

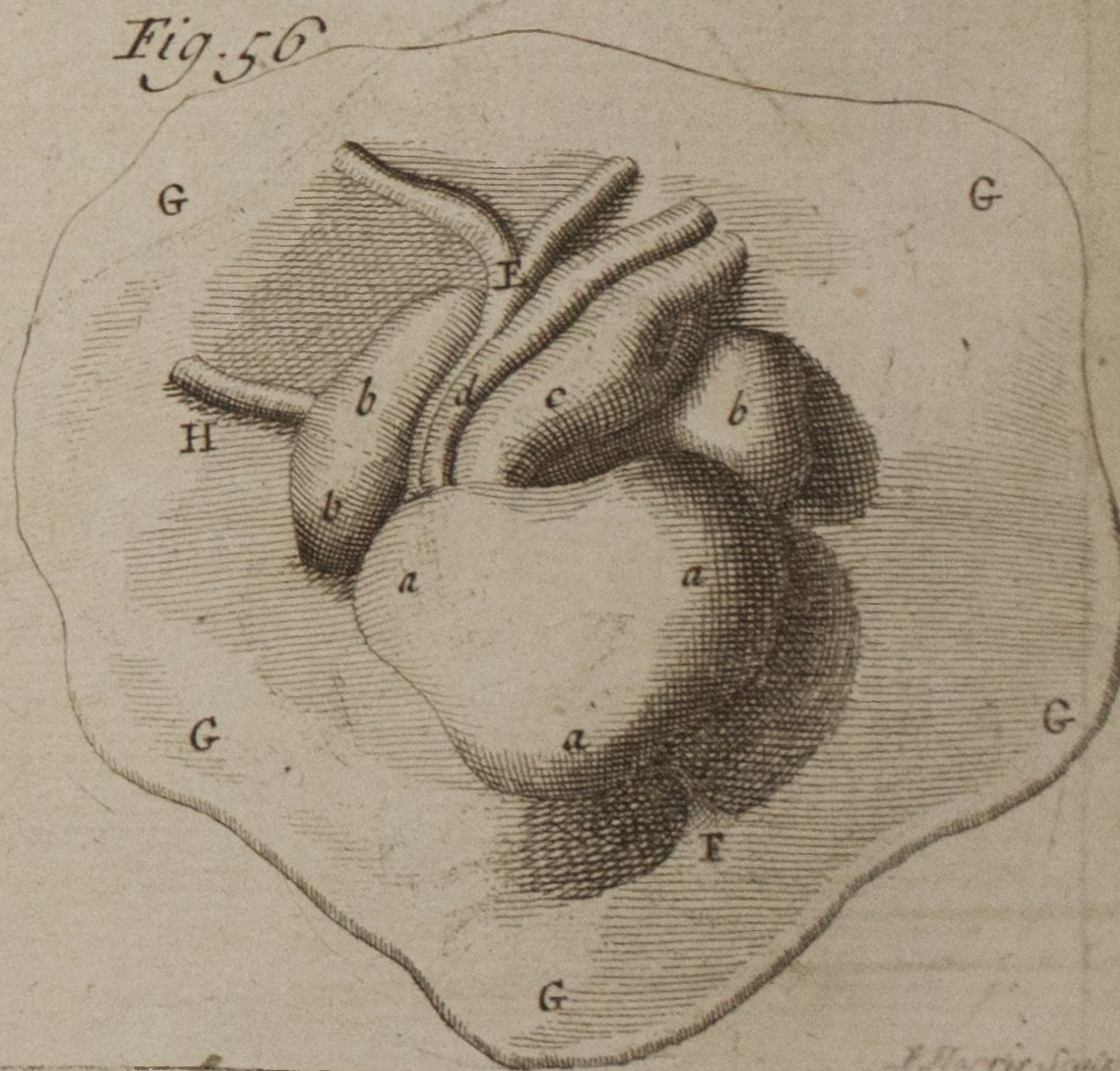
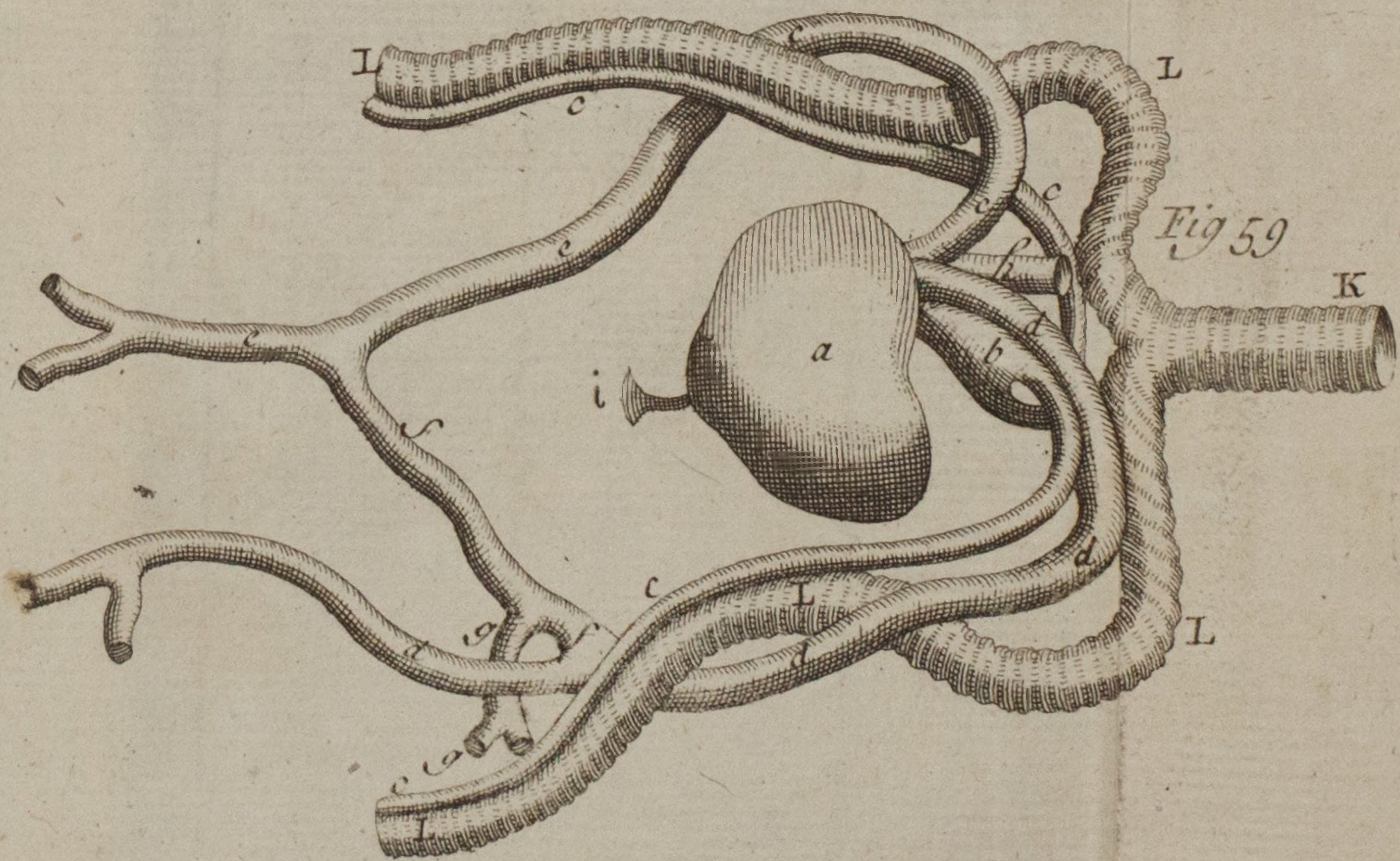
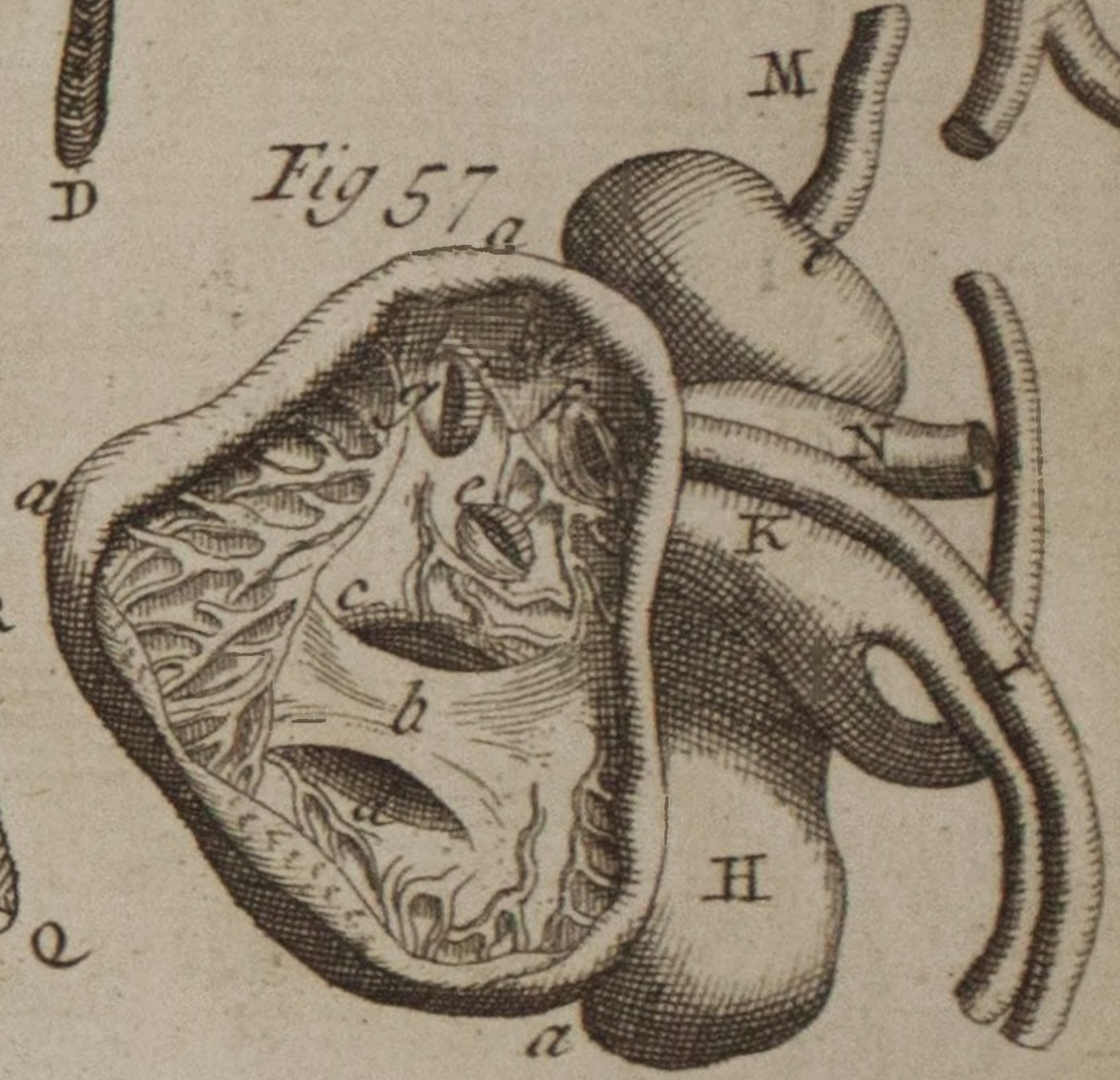
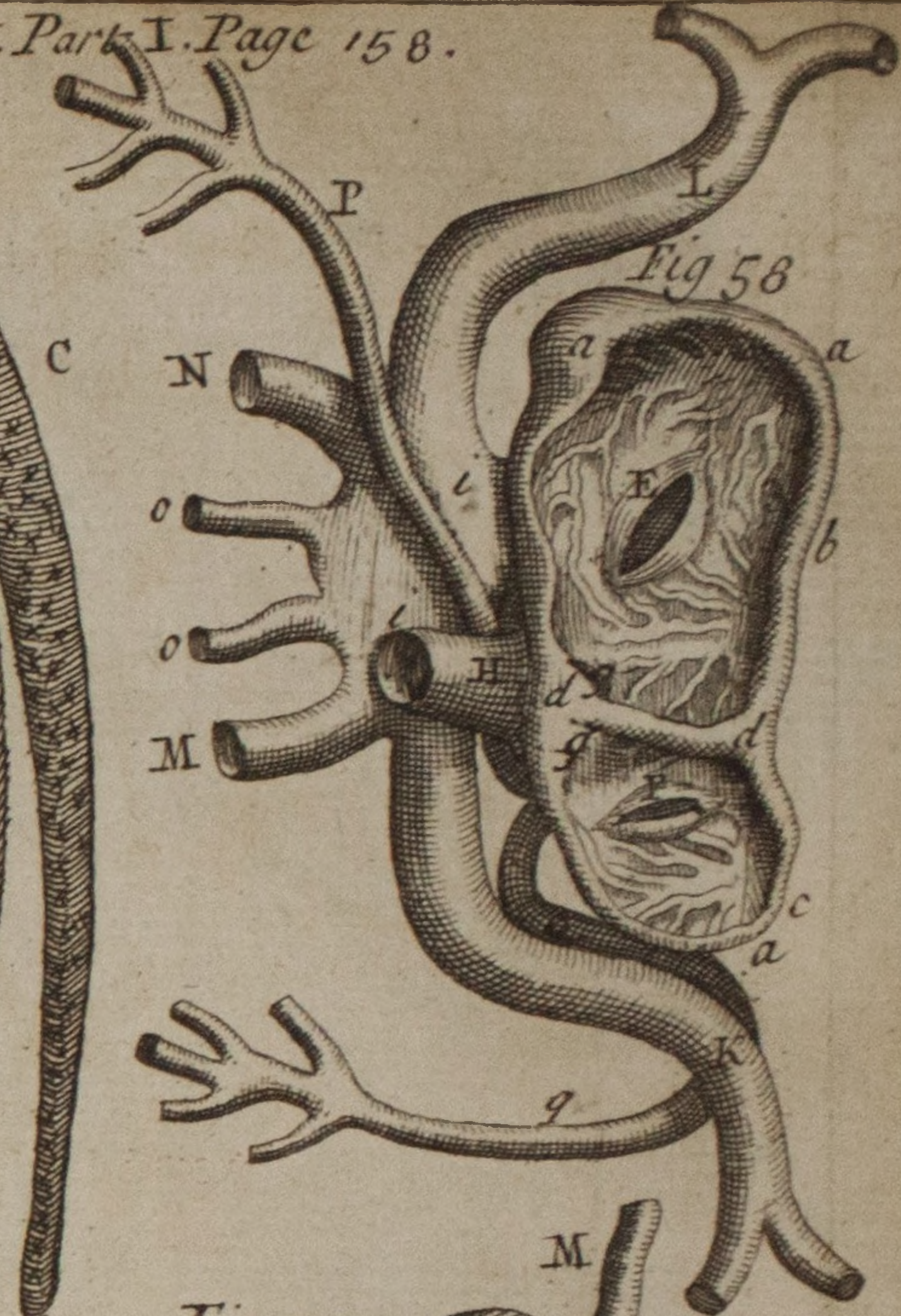
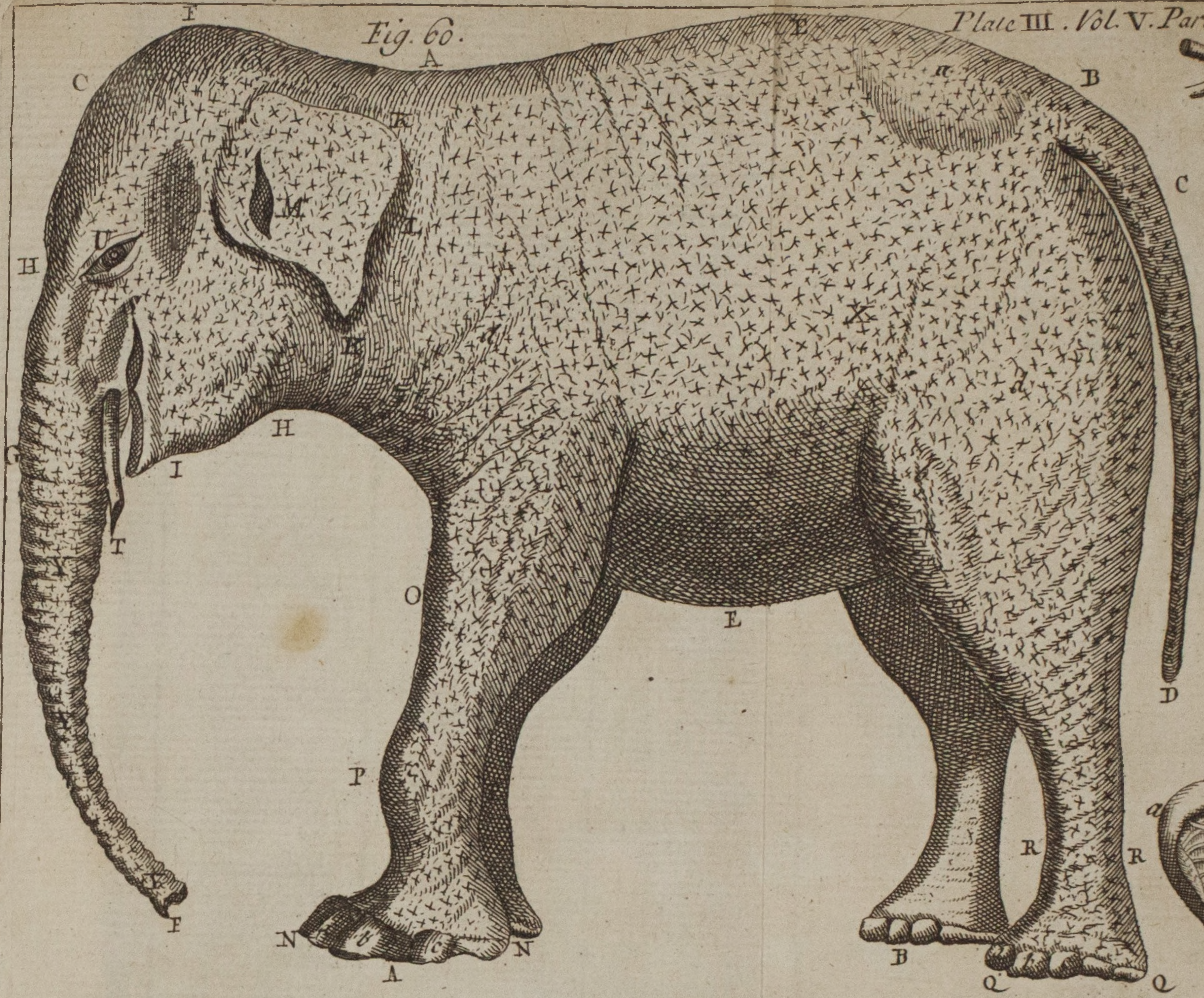
S, The Mouth. T, The Tusks broken off by the Middle. U, The Eye. X, Represents the Scabs about the Belly. Y, Y, The Depressions in the Skin thro' the Folding of the *Proboscis*. a, A Protuberance first occasion'd by the *Ossa Innominata*, when the Animal was alive and very lean, and still remaining in the Skin. b, A Protuberance in the Fore-part of the Thigh. c, The lower Joint of the Fore-foot, where there is a Depression in the Skin. d, d, Several Wrinkles in the stuff'd Skin.

Fig. 61.

Fig. 61. Represents the Skeleton of the Elephant, as it now stands in the Repository of Rarities in Dundee.

Fig. 61.

A, The Skull taken in Profile, whereby a Part of the fore Side is fore-shorten'd. *a*, The Hole for the Root of the Trunk fore-shorten'd. *b, b*, The two *Ossa Palati*. *c, c*, The two Tusks as they proceed from the *Ossa Palati*. *d, d*, The broken off Extremities of the Tusks. *e*, The Grinders of the upper Jaw. *f*, The fore Grinder of the lower Jaw. *g*, The undulating Lines of the lower Surface of the Grinders of the upper Jaw. *h*, The inner Grinder of the lower Jaw. *i*, Part of the *Os Male*. *k*, It's Articulation with the *Os Zygomaticum*. *l*, The *Os Zygomaticum*. *m*, The Orbit of the Eye. *n*, It's upper Protuberance. *o*, It's middle Protuberance where the *Trochlea* is inserted. *p*, It's lower Protuberance. *q*, A *Sinus* at the Bottom of the Orbit. *r, r*, A Depression fit for lodging the Muscle, of the lower Jaw and *Proboscis*. *s*, The Orifice of the *Meatus Auditorius*. *t, t*, The Articulation of the *Os Calvaria* with the *Os Zygomaticum*. *u*, The *Processus Coronæ* of the lower Jaw. *x*, The Insertion of the *Musculus Masseter*. *y*, The Space for the Mouth betwixt the *Os Palati* and lower Jaw. *z*, An Orifice from which the *Nervus Maxillaris inferior* proceeds. B, The *Vertebrae* of the Neck. 1, The first *Vertebra*. 2, The second *Vertebra*, or Tooth, which rises higher than the rest. 3, The third *Vertebra* having scarce any Spinal Process. 4, The 4th, whose Spinal Process is not yet seen. 5, The 5th, with the Spinal Process beginning to appear. 6, The 6th, whose Spinal Process ascends higher, and is remarkable at it's fore-part, as in *Fig. 104, 105*. 7, The 7th, whose Spinal Process still ascends, and with whose back-part the first Rib is articulated. C, The *Vertebrae* of the Back. 1, — — 13, Their *Processus Spinosi*, which have no Protuberance at their Extremity, whereof 1, — — C, are the longest, and C, — — 13, become gradually shorter. D, The Spinal Processes of all the rest of the *Vertebrae* to the *Os Sacrum*, which are shorten'd by Degrees. xxxxx &c. The oblique Processes of the *Vertebrae*. E, The *Scapula*. *a, a*, The spongy Margin of the *Scapula*. *b, b*, It's *Processus Spinosis* sending forward a Protuberance. *c, c*, It's Neck. *d, d*, The *Epiphysis* which receives the *Humerus*. *e, e*, &c. The Ribs. *f, f*, &c. The Ribs which appear on the opposite Side. *g, g*, The Cartilages of the *Sternum*. *h, h*, The Bones of the *Sternum*. *i, i, i*, The three Ribs which have no Cartilages. *l, l, l*, The Bodies of the three *Vertebrae Lumborum*. F, The *Humerus*. 1, It's upper-part, spongy and rugous, for the Insertion of Tendons. 2, It's middle-part more solid. 3, a large oblique *Sinus* for lodging the *Biceps*. 4, It's lower Extremity articulated with the *Cubitus* and *Radius*. G, The *Cubitus* and *Radius*. 1, The *Olecranon*. 2, An Hollowness on the Outside of the *Cubitus*. 3, The *Radius*. 4, It's lower *Epiphysis*, rugous, and separated from it by a Suture. 5, The lower *Epiphysis* of the *Cubitus*, separated likewise by a Suture. 6, 6, 6, Three Bones of the first Rank of the *Carpus*. 7, 7, 7, Three Bones of the second



second Rank. 8—8, The Bones of the *Metacarpus*. 9—9, The first Bones of the Toes. 10—10, The second Bones of the Toes. H, H, The *Ossa Innominata* represented in *Profile*. I, The *Pelvis*. K, The Tail. L, L, The Two Thigh-Bones. 1, The *Epiphysis* receiv'd by the *Ossa Innominata*, and articulated with the *Femur* by a Suture. 2, The *Trochanter major*. 3, The lower *Epiphysis*. 4. The *Patella*. M, The *Tibia*. 1, *Perone*. 2, The *Talus*. 3, The Bones of the *Tarsus*. 4, The Bones of the *Metatarsus*. 5, The Bones of the Toes.

Fig. 62, Represents the Fore-part of the Head.

a, The Hole for the Root of the Trunk. b, The lower Part of the *Os Palati*, over which hangs the *Proboscis*. c, c, A Depression of the Bone on each Side, for lodging of the Muscles of the lower Jaw. d, d, The two Eminences on each Side at the top of the Head. e, A Depression in the Middle betwixt these two Eminences. f, f, Two Beginnings of the Angles for forming the Depressions for the Muscles of the lower Jaw, betwixt which the Surface of the Bone begins to be plain. g, The upper Production of the *Sinus* where the Eye is lodg'd. h, The Beginnings of the *Laminae* which run betwixt the two Tables of the Skull, and here appear in the Bottom of the Hole for the Root of the *Proboscis*. i, The *Os Vomeris*, to which the *Cartilaginous Septum* of the *Proboscis* was adherent. k, The Beginning of the Depression of the *Os Palati*. l, The Middle of the *Sinus* for the Orbit of the Eye. m. The Articulation of the two *Ossa Palati*. n, n, The Articulation of the *Os Maxillæ* with the *Os Palati*; where also is a *Crena* for containing the Blood-Vessels, as they go to the Nourishment of the *Proboscis*. o, o, The Place where the Tusks proceed from the *Os Palati*. p. p. The Upperpart of the Articulation of the *Os Maxillæ* with the *Os Palati*. q, q, The broken Extremities of the Tusk. r, r, A great Oval Hole in the *Os Maxillæ*, thro' which a considerable Branch of the 5th Pair of Nerves, and a large Artery from the *Arteria duræ Matris* pass to and are dispers'd in the *Proboscis*, and by which a big Vein returns and joins to the *Vena jugularis*. s, The *Os Zygomaticum*. t, The middle Production for the Orbit of the Eye.

Fig. 62.

Fig. 63. Represents the Side of the Head.

a, The Beginning of the Depression for the Muscles of the lower Jaw and *Proboscis*. b, The Insertion of the *Retractoris Proboscidis*. c, The Insertion of the *Musculus Temporalis*. d, The Bottom of the Orbit of the Eye. e, It's upper Production. f, It's lower Production. g, The Articulation of the *Os Maxillæ* with the *Os Zygomaticum*. h, The *Os Zygomaticum*. i. The Articulation of the *Os Zygomaticum* with the *Os Calvaria*. k, The Orifice of the *Meatus Auditorius*. l, One of the *Condyles* of the *Occiput*, which is articulated with the first *Vertebra*. m, The Orifice of the large Oval Hole in the *Os Maxillæ*. n, The fore Grinder of the upper Jaw. o, The hind Grinder or rather Wedge for keeping the fore Grinder fast. p, The undulate Lines in the lower Surface of the Teeth. q, The Beginning of the Tusks as they

Fig. 63.

they proceed from the *Os Palati*. *r*, Their broken off Extremities. *s*, The *Sinus* in the Bottom of the Orbit of the Eye for the *Nervus Opticus*.

Fig. 64. Represents the Back-part of the Head.

Fig. 64.

a, a, The two Eminences at the Upper-part of the Head enlarg'd, whereby the *Sinus* betwixt them becomes narrower and deeper. *b*, The *Sinus* betwixt these Eminences shorten'd. *c, c*, The two *Condyles* which are receiv'd by the first *Vertebra*. *d*, The Hole for the Spinal Marrow. *e, e*, Two Protuberances above the *Meatus Auditorius*. *f*, The Orifice of the *Meatus Auditorius*. *g*, A *Sinus* whence the *Processus Styloides* arises, which is shewn by itself. *h*, The Cartilages whereby the *Processus Styloides* is articulated with the Skull. *i*, It's longest and smallest Part. *k*, It's shortest and biggest Part. *l*, The Orifice for the *hard Portion*. *m, m*, The Hole for the Jugular Vein and *Par Vagum*. *n, n*, The bony Part of the *Aqueduct*. *o, o*, The Extremity of the *Aqueduct* where the fleshy Part begins. *p, p*, The Hole for the Carotid Artery. *q, q*, The Hole for the *Arteria Durae Matris*, and 3d Branch of the 5th Pair. *r*, The middle of the Base of the Skull beneath the Hole for the Spinal Marrow, where the Bone is somewhat raised. *s*, A Depression on the Base of the Skull before the *Choana* begins. *t*, The *Choana*, or Passage between the Root of the Trunk and the Mouth. *u*, A Production of the *Vomer*, or *Septum*, which divides the *Choana* in two. *x*, The Articulation of the *Os Zygomaticum* with the *Os Occipitale*. *y*, The *Glenoid* Cavity for Reception of the lower *Condylus* of the lower Jaw. *z*, The *Sinus* for the Globe of the Eye. *1*, The *Os Zygomaticum*. *2*, The Fore Grinder on the right Side. *3*, The hind Grinder on the right Side. *4*, The hind Teeth on the left Side, which not grinding at all, only serve as a Wedge. *5*, The fore Teeth on the left Side, the back-part of which does not grind. *6, 6*, The lower Surface of the Grinders, where their undulate Lines appear. *7, 7*, Part of the *Os Maxilla*, where it is articulated with the *Os Zygomaticum*. *8, 8*, The great Oval Hole in the *Os Maxilla*. *9, 9*, The back-part of the *Os Palati*. *10*, The Interstice between the *Ossa Palati* on the back-side. *11, 11*, The Tusks as they proceed from the *Os Palati*. *12, 12*, The two broken off Extremities of the Tusks.

Fig. 65. Represents the Skull saw'd transversely, so that it's Lower-part with the Base appear.

Fig. 65.

a, a, The outward Table of the Skull. *b, b*, The inner Table. *c, c*, The *Laminae* which pass betwixt the two Tables. *d, d*, The *Cells* form'd by these *Laminae*. *e, e*, The Orifices for Vessels which penetrate the *Laminae*. *f*, The Seat of the Brain, represented more at Length in Fig. 64. *g, g*, The two *Condyles* which are receiv'd by the first *Vertebra*. *h*, The Hole for the Spinal Marrow. *i*, The *Os Zygomaticum*.

Fig. 66.

Fig. 66. Represents the upper part of the Skull saw'd transversely, with the *Cells* running betwixt the two Tables and *Laminae* which cover the Seat of the Brain.

Fig. 67.

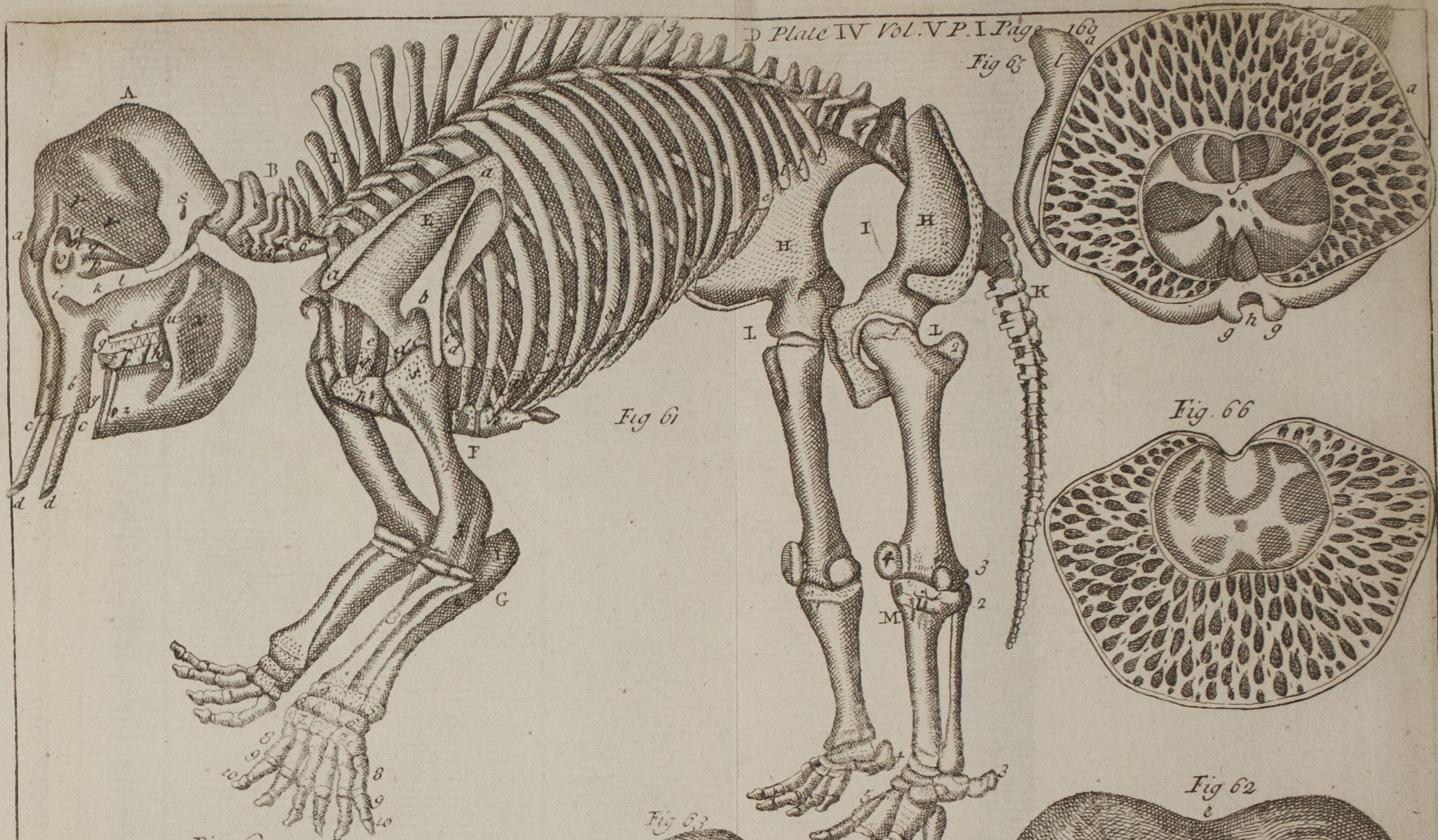


Fig. 61

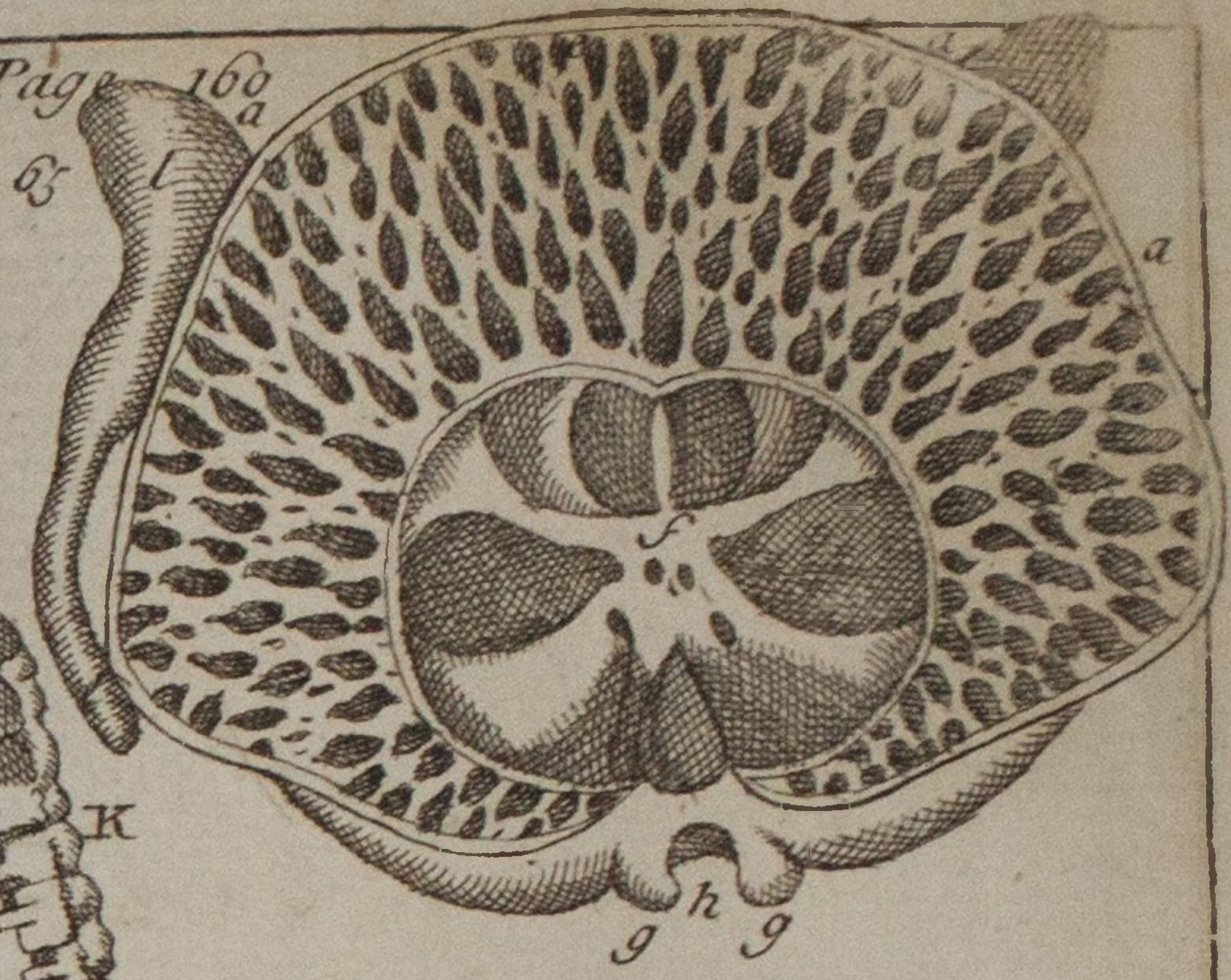


Fig. 63

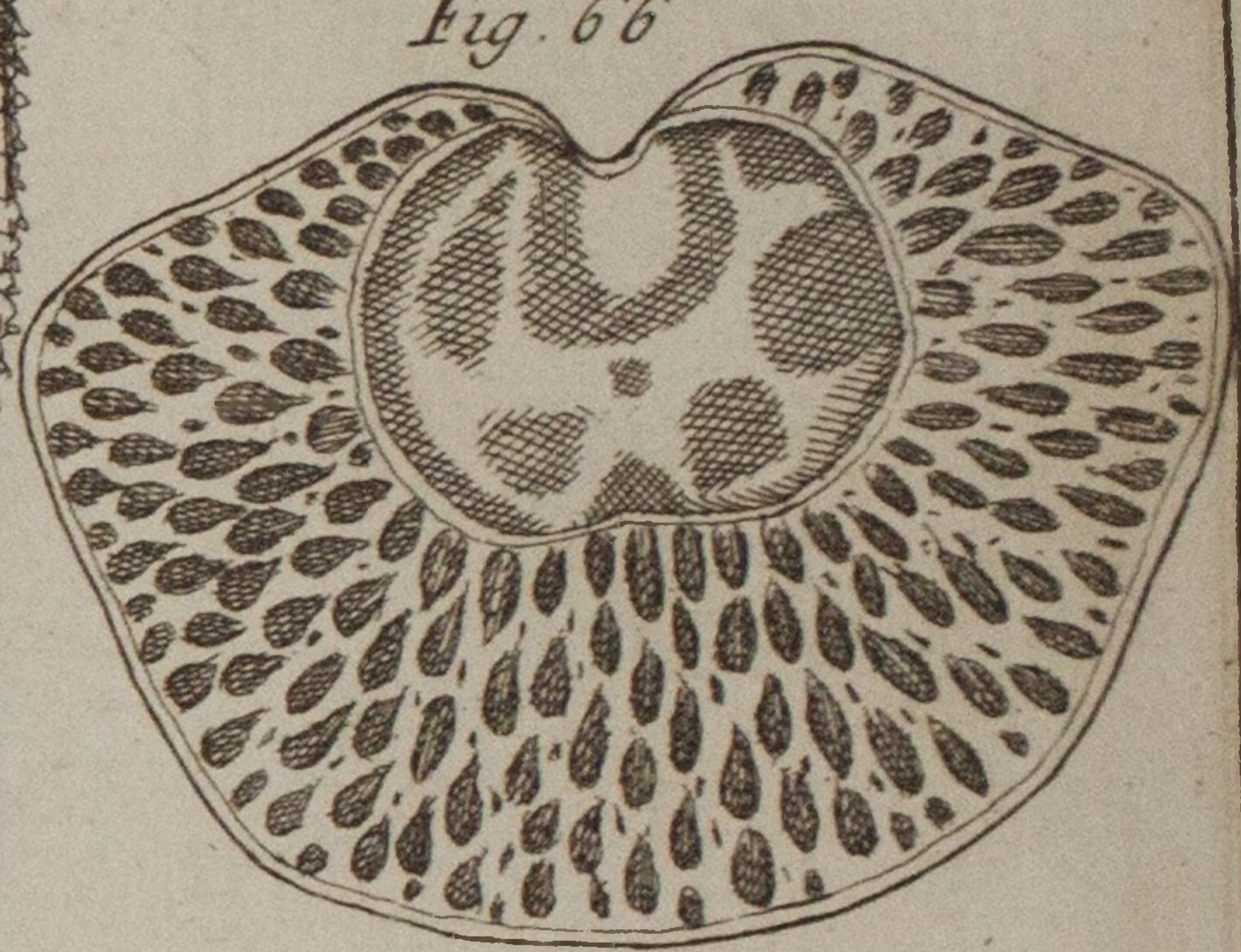


Fig. 66

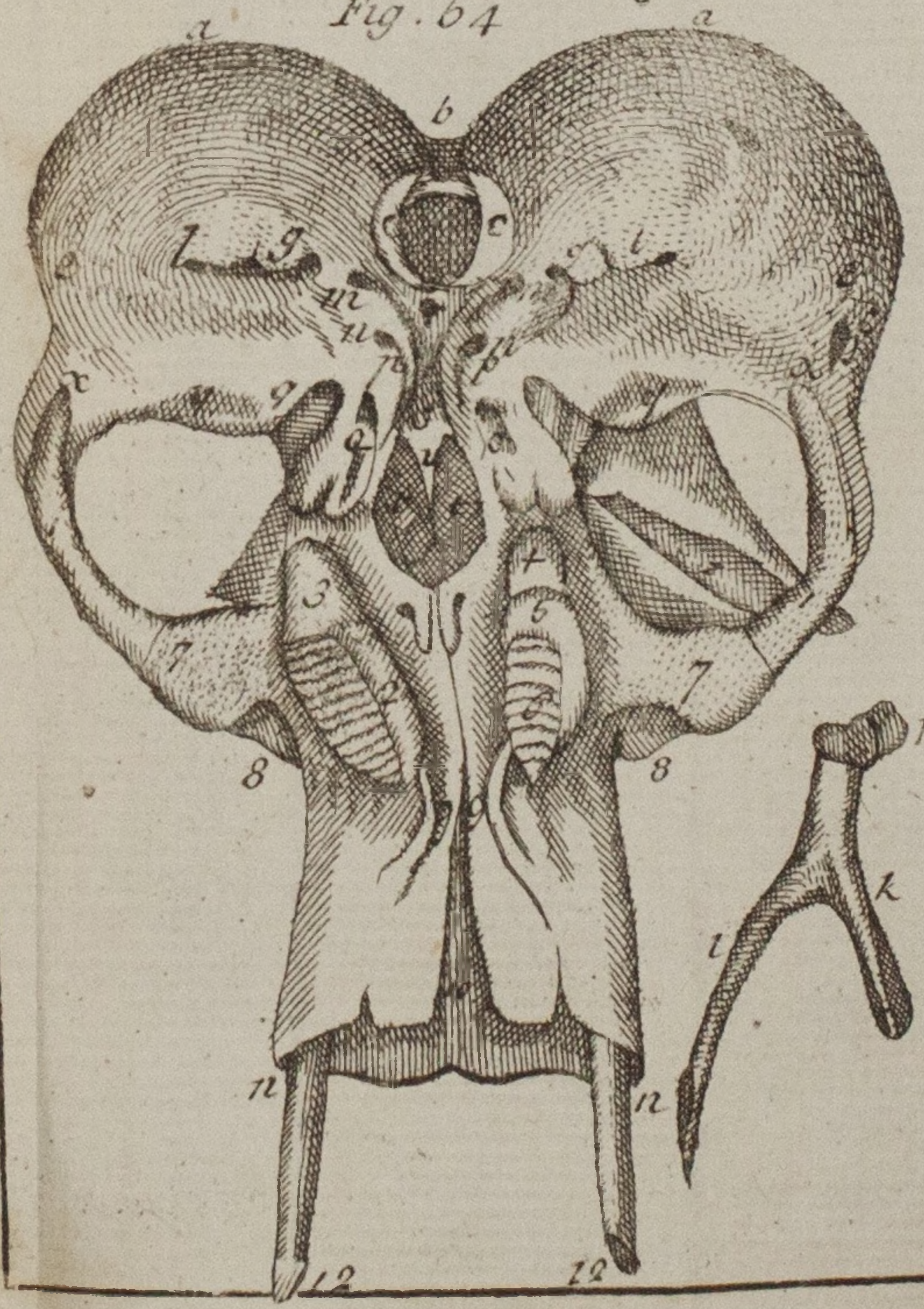


Fig. 64

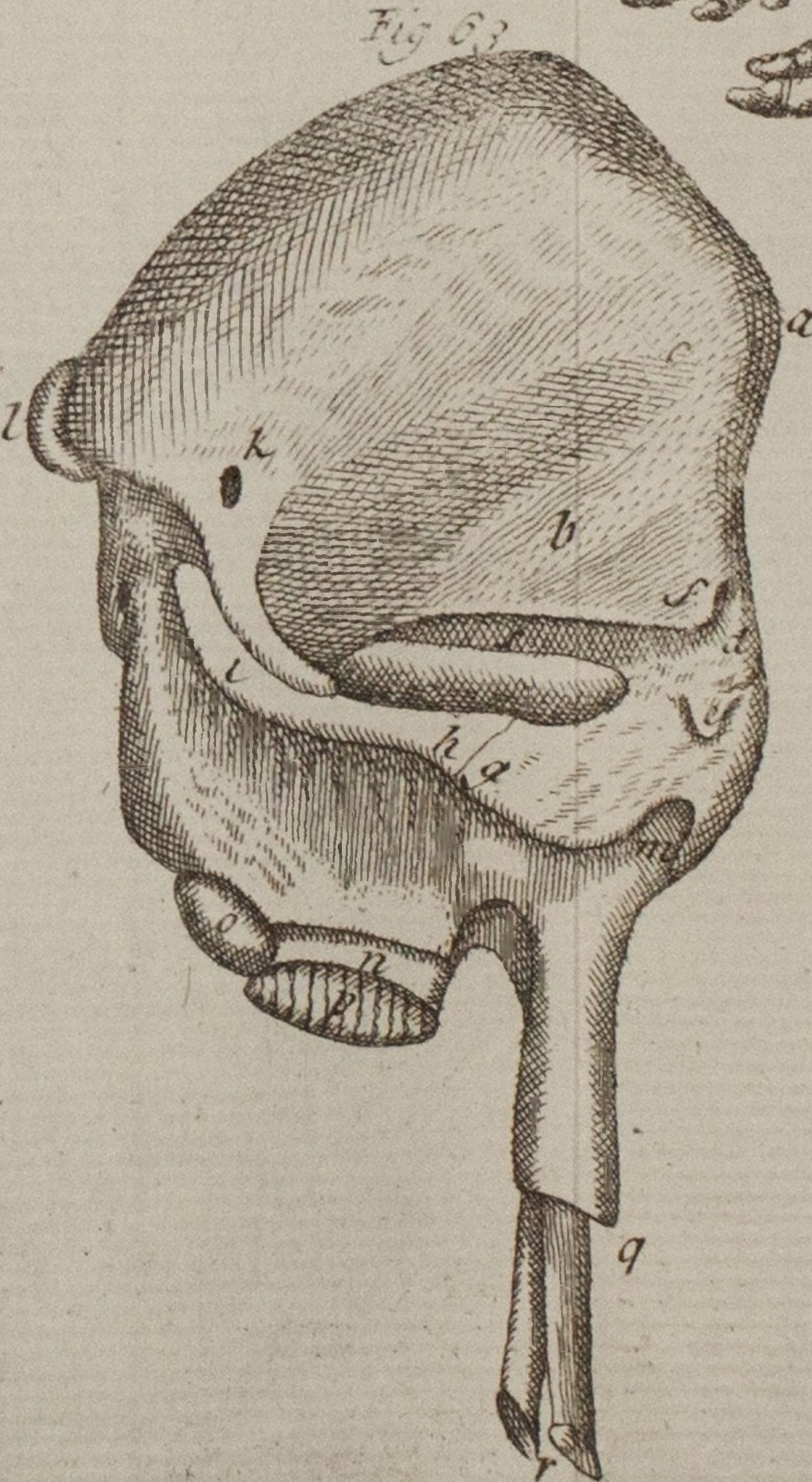


Fig. 65

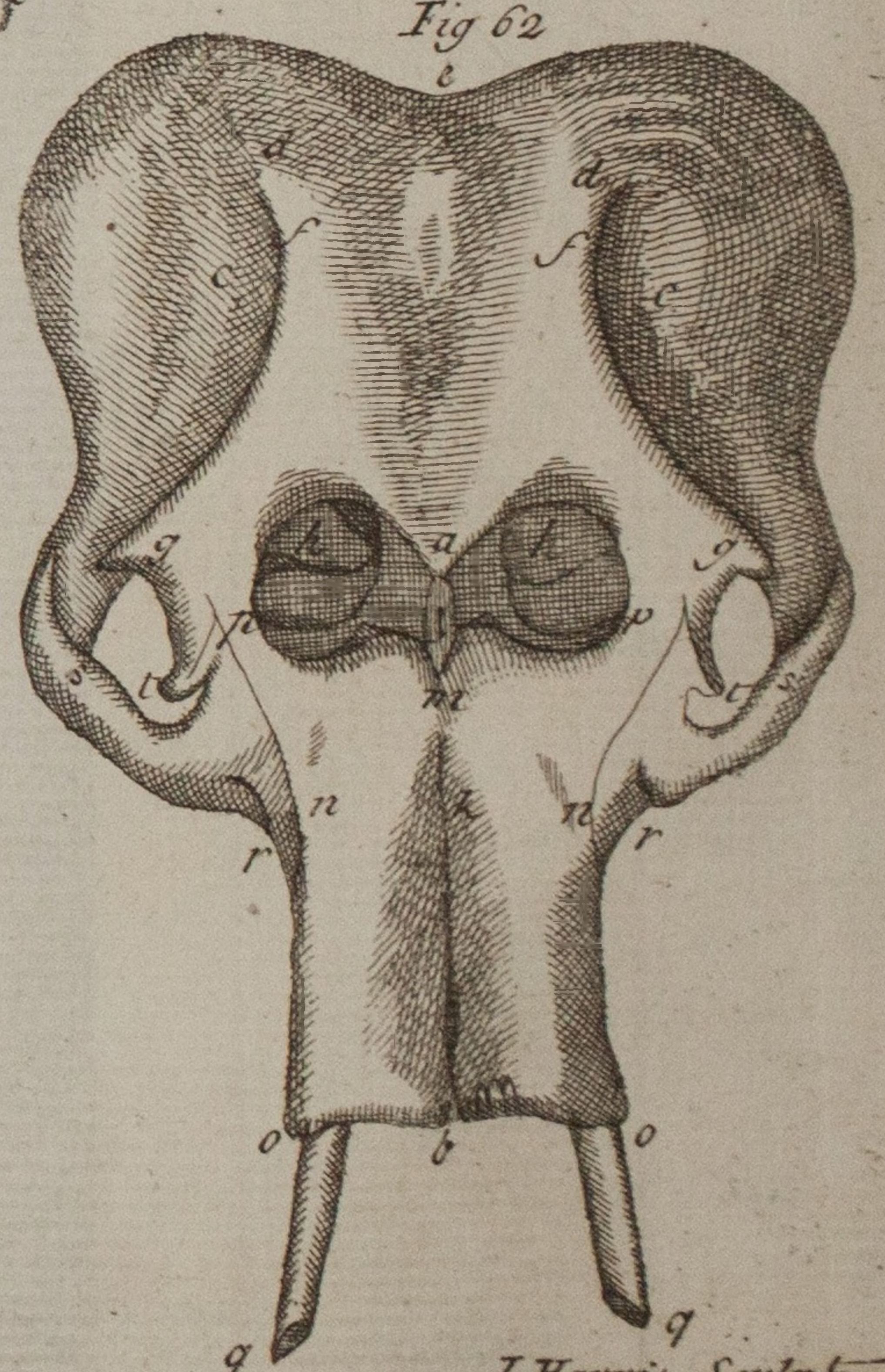


Fig. 62

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Fig. 67. Represents the Outside of the Upper-part of the Skull saw'd transversely.

Fig. 67.

a, a, Two Eminences on the Top of the Skull. *b*, A Sinus betwixt these two Eminences. *c*, A long Spina in the Bottom of the Sinus.

Fig. 68. Represents the Fore-part of the lower Jaw.

Fig. 68.

a, a, The two Condyles. *b, b*, The two *Processus Coronæ* shorten'd by the opposite View. *c, c*, The fore Grinders of the lower Jaw. *d*, The Distance between the two Jaws for lodging the Tongue. *e*, The *Symphysis Menti*.

Fig. 69. Represents the Back-parts of the lower Jaw.

Fig. 69.

a, a, Two Condyles. *b, b*, Two large Orifices of a Cavity, whereinto enter the Vessels for nourishing the Teeth, and wherein are lodg'd the *Rudimenta Dentium*, as in Fig. 90. *c, c*, The two fore Grinders of the lower Jaw. *d, d*, The undulate Lines in their upper Surface. *e*, The Distance between them for lodging the Tongue. *f*, The concave Part of the lower Jaw.

Fig. 70. Represents one Side of the lower Jaw.

Fig. 70.

a, a, The two Condyles. *b, b*, The two *Processus Coronæ*. *c*, A protuberant Part of the lower Jaw, where the *Rudimenta Dentium* are lodg'd. *d*, The inner Grinder of the lower Jaw. *e*, The outward Grinder, where are represented the Ridges and Interstices of the Sides of the Teeth. *b*, The *Symphysis Menti*.

Fig. 71. Represents the bony Part of the Meatus Auditorius of the Right Ear.

Fig. 71.

a, The external Orifice of the *Meatus Auditorius*. *b*, The *Processus Petrosus*. *c*, The Orifice where the *Nervus Auditorius* enters. *d*, The *Meatus Auditorius*. *e*, A Part of the *Laminæ*, which proceed from it on each Side, by which the *Cellules* betwixt the two Tables of the Skull are form'd; those situated above the *Meatus* being remov'd. *f*, Part of the inner Table of the Skull.

Fig. 72. Represents Part of the Meatus Auditorius open'd, with other Parts of the inner Ear.

Fig. 72.

a, The ragged Part of the Bone, from whence the *Os Petrosum* was separated. *b*, The *Processus Petrosus* open'd. *c*, The *Crena* for the *Membrana Tympani*. *d*, The Honey-comb Cavity of the *Tympanum*. *e*, It's inner Cavity of a smooth Surface. *f*, It's semi-circular or undulate Lines. *g*, The Orifice of the *Aqueduct*. *h*, The Orifice of the hard Portion of the *Nerve*.

Fig. 73. Represents the lower Surface of the *Os Petrosum*, as it was separated from above the *Tympanum*, and other Parts of the inner Ear.

Fig. 73.

a, a, The ragged Margin of the Bone. *b, b*, The upper Part of the *Cavitas Tympani*. *c*, The *Foramen Ovale*. *d*, The Protuberance in which the *Labyrinth* and *Cochlea* are lodg'd. *e*, The Orifice of the hard Portion of the *Nervus Auditorius*.

Fig. 74. Represents the Malleolus alone in it's true Dimensions.

Fig. 74.

1, The protuberant Head. 2, The semi-circular *Sinus* betwixt it and the Margin. 3, The *Sinus* which receives the Head of the *Incus*. 4, The Angle below the *Sinus*, for the Head of the *Incus*. 5, The Angle where the *Manubrium Malleoli* begins. 6, The *Manubrium Malleoli*.

Fig. 75. Fig. 75. Represents the *Incus*.

1, The Head of the *Incus*. 2, The *Sinus* or Neck of the *Incus*. 3, Two *Apophyses*. 4, A long Protuberance with the *Sinus* for the *Os Quadrangulare* at it's Extremity.

Fig. 76. Fig. 76, 77, 78, Represent the *Stapes*.

1, The small Part of the *Stapes*, where it is articulated with the *Incus*, with a *Sinus* at it's Extremity, being the other Half of the Cavity for the *Os Quadrangulare*. 2, 2, Two small Portions of the *Stapes*, where it is articulated with the *Basis*.

Fig. 77. Fig. 77. The *Basis* of the *Stapes* separated.

Fig. 78. Fig. 78. The whole *Stapes*.

Fig. 79. Fig. 79. The *Malleolus* and *Incus* join'd together, with their lower Side turn'd up.

1, The *Malleolus*. 2, It's Articulation with the *Incus*. 3, The *Incus*. 4, The *Manubrium Malleoli*. 5, A Point of the *Incus*, fram'd by the other two Productions. 6, The long Protuberance of the *Incus*. 7, The *Sinus* in the Extremity of it's long Production.

Fig. 80. Fig. 80. The *Malleolus*, *Incus*, and *Stapes* articulated together.

1, The *Incus*. 2, The *Malleolus*. 3, The *Stapes* where it shuts the *Foramen Ovale*.

Fig. 81. Fig. 81. Represents the Upper-part of the *Lineæ Semilunares*, or that Side which is towards the Passage of the *Nervus Auditorius*.

a, The five Extremities cut off. b, The *Linea Semilunaris Major*. c, The *Semilunaris Media*. d, The *Minor*. e, The common Canule between the *Major* and *Media*.

Fig. 82. Fig. 82. Represents the *Cochlea* and *Labyrinth* together.

a, The *Vestibulum*. b, The *Foramen Ovale*. c, The *Foramen Oblongum*. d, The *Linea Semilunaris Minor*, which is towards the *Cavitas Tympani*. e, The common Canule to the *Major* and *Media*. f, The *Major*. g, The *Media*. h, The *Cochlea*.

Fig. 83. Fig. 83. Represents the *Cochlea*.

Fig. 84. Fig. 84. The *Vestibulum*.

b, The third *Gyre* or Turning. c, The Orifice. d, The first *Gyre* or Turning opened. e, The second Turning. g, The Orifice at the Top of the *Cochlea*.

Fig. 85. Fig. 85. Represents the Seat of the *Brain* enlarg'd, that the Orifices for the *Blood-Vessels* and *Nerves* may be the more obvious.

a, a, The inner *Table* deprived of the surrounding *Cellules*. b, b, The anterior *Sinus*. c, c, The *Os Ethmoides*, with it's *Eminences*, *Sulci*, and *Foramina* for the *Nervus Olfactorius*. d, The *Crista Galli*. e, e, The anterior *Eminences*. f, f, The Orifice for the *Nervus Opticus*. g, g, The Hole

Hole called the *Foremen Lacerum*, through which pass the *Nervi Motorii Pathetici Ophthalmici*, or first Branch of the 5th and the 6th Pair. *b, b*, The second Branch of the 5th Pair. *i, i*, The third Branch of the 5th Pair. *k, k*, The Hole for the *Arteria duræ Matris*. *l, l*, The Hole for the Carotid Artery. *m, m*. The Hole for the *Nervus Auditorius*. *n, n*, The Hole for the Jugular Vein. *o*, The Hole for the Spinal Marrow. *p, p*, Part of the two *Condyles*. *q*, The External Hole for the Spinal Marrow. *r, r*, The two middle *Fossæ*. *s, s*, The *Processus Petrosus*. *t, t*, The *posterior Fossa*, or Seat of the *Cerebellum*. *u*, The Seat of the *Glandula Pituitaria*. *x*, The *Crena*.

Fig. 86. Represents the Uterus.

Fig. 86.

a, a, Part of the *Ligamenta Lata Uteri*. *b*, Part of the *Vagina* cut off. *c*, The Beginning of the Body of the *Uterus*. *d*, Divided into two Portions, with an Interstice in the Middle. *e, e*, Several Eminences representing the external Part of so many *Cellules*. *f, f*, The *Cornua Uteri*. *g*, A loose Membrane wrapt up, that the *Ovaria* below may appear. *h*, The *Ovarium* depriv'd of the thick loose Membrane which fluctuates above it. *c*, The *Ovarium* cover'd with the Membrane.

Fig. 87. Represents the Proboscis cut transversely.

Fig. 87.

a, a, The two Cavities of the *Proboscis*. *b*, The *Septum* which divides the Cavities. *c, c*, The tendinous Interfection which runs from before to behind. *d, d*, The tendinous Interfection which runs from the Right to the Left. *e, e, e, e*, The Insertion of the four Muscles into the tendinous Interfection, whereby the Fibres of the one ascend, and the other descend obliquely.

Fig. 88. Represents the dissected Proboscis.

Fig. 88.

a, The external Part of the Cartilage which surrounds the Cavity of the *Proboscis*, as it arises from the Hole in the Fore-part of the Skull. *b, b*, That Pair of Muscles call'd the *Levatores Proboscidis*, rais'd from above the foresaid Cartilages, with their inner Surface turn'd up, that the Divarications of the Blood-Vessels in them may appear. *c, c*, The Orifices of the Veins dispers'd in these Muscles. *d, d*, The Orifices of the Arteries. *e, e*, Their several Branchings. *f*, The Descent straight along above the Cavity of the *Proboscis*. *g, g*, The oblique Descent of the Fibres of the *Erectores* of the *Proboscis*. *h*, The tendinous Interfection running down the Middle of the *Proboscis*. *i, i*, The Orifices of the Cavities of the *Proboscis*.

Fig. 89. Represents the Extremity of the Proboscis cut off.

Fig. 89.

a, A Protuberance arising from the Fore-part of the Extremity of the *Proboscis*, and is extended into a Cavity in the Back-part *b*, whereby the Animal catches hold of any thing.

Fig. 90. Represents one of the Rudiments of the Teeth, which was taken out of the great Hole in the inner Side of the lower Jaw, as represented (*b*, Fig. 69.), but much enlarg'd in the Proportion.

Fig. 90.

a, It's upper Part, which is hard, solid, and white. *b*, It's middle Part distinguish'd by several Furrows and Ridges. *c*, It's lower Part, which is hollow, and whereinto both the Blood-Vessels that serve for it's Nourishment, and a Branch of the Nerve call'd *Maxillaris Inferior*, proceeding from the fifth Pair, enters.

Fig. 91.

Fig. 91. Represents a Portion of the Cuticula, wherein is shewn it's inner Surface, and usual Thickness; at it's Margin at the Left Hand, and lower Part, are several white Lines, which I take to be the Lineaments of so many Blood-Vessels; the Pyramids, from whence the Hairs proceed, with the several Favi or Depressions.

Fig. 92.

Fig. 92. Represents one of the Scabs adhering to the Cuticula, where they are thickest.

Fig. 93.

Fig. 93. The first Vertebra of the Neck with it's upper Part in Profile, to shew the Holes for the Arteria Vertebralis.

a, a, Two Protuberances, which reach on each Side to the Skull. *b, b*, Two Cavities fore-shorten'd, which receive the Condyles of the Skull. *c, c*, The two Holes whereby the Arteria Vertebralis proceeds from the Skull, and perforates this Vertebra. *d, d*, Two Holes through which the Artery passes out from this Vertebra. *e, e*, A Crena betwixt the two aforesaid Holes, where the Artery is lodg'd.

Fig. 94.

Fig. 94. The Fore-part of the first Vertebra shewn at large. *a*, The Hole for the Spinal Marrow. *b*, The Hole for receiving the Tooth of the following Vertebra. *c, c*, Two Cavities for receiving the Condyles of the Skull. *d, d*, Two Holes for the Cervical Artery. *e*, The upper Part of the Vertebra. *f*, It's lower Part. *g, g*, The transverse Processes, whose Protuberances at the Extremities are represented, *a, a*.

Fig. 95.

Fig. 95. The Back-part of the first Vertebra shewn at large.

a, The Hole for the Spinal Marrow. *b*, The Hole for the Tooth of the following Vertebra. *c, c*, The Cavities which receive the Body of the following Vertebra. *d*, The lower Part of the Vertebra. *e, e*, The Holes for the Cervical Artery. *f, f*, The two transverse Processes.

Fig. 96.

Fig. 96. The Fore-part of the second Vertebra.

a, a, The forked Extremities of the Protuberance, which arises instead of the *Processus Spinosus*. *b*, A Sinus betwixt them. *c*, The Hole for the Spinal Marrow. *d*, The Tooth which is receiv'd by the first Vertebra. *e, e*, The two convex Surfaces which are receiv'd into the hind Cavities of the first Vertebra. *f, f*, The two Holes for the Cervical Artery. *g, g*, Two transverse Processes. *h*, The lower Part of the Vertebra.

Fig. 97.

Fig. 97. The Back-part of the same Vertebra.

a, a, The Protuberances of the *Processus Spinosus*. *b*, The Sinus betwixt them enlarg'd on the Side. *c*, The Hole for the Spinal Marrow. *d*, The Point of the Tooth appearing from the other Side. *e, e*, The Holes for the Cervical Artery. *f*, The concave Body of the Vertebra, which receives the convex Surface of the following Vertebra,

Vertebra. g, g, The *transverse Processes.* b, b, The two oblique Processes which receive the oblique Processes of the following *Vertebra.*

Fig. 98, 99, 100, 101, 102, 103, 104, 105, 106, 107. Note, Fig. 98, 99, 100, 101, 102, 103, 104, 105, 106, 107. That the five following *Vertebrae* are represented by A, B, Fig. 98, 99, 100, 101, &c. whereof A, represents the Fore-part. B, the Back-part; all the rest of the small Letters shewing as follows.

a, a, &c. The Hole for the Spinal Marrow. b, b, &c. Their convex Bodies, which are received by the concave Surfaces of the following. c, c, &c. Their concave Bodies, which receive the convex Surfaces of the former. d, d, &c. The Holes for the Cervical Artery. e, e, &c. The oblique Processes. f, f, &c. The transverse Processes. g, g, &c. The Spinal Processes, which in the Fore-part of the 3d and 4th *Vertebra* (Fig 98, 100.) scarcely appear, but in their Back-part (Fig. 99, 101.) appear a little, in the 5th (Fig. 102, 103.) arise to 1 1/2 Inch, and in the 6th (Fig. 104, 105.) to 3 Inches. b, b, In the 6th and 7th (Fig. 104, 105, 106, 107.) are Protuberances, which run back to guard the Cervical Artery as it passes from between the Bodies of the *Vertebrae*, and quits the Perforation in their transverse Processes. i, i, Two *Sinus*'s in the Back-part of the seventh *Vertebra*, which with the like Surfaces in the following make up a Cavity whereinto the *Condyles* of the first Ribs are received.

Fig. 108. Represents the *Scapula.*

Fig. 108.

a, The Head of the *Scapula*, whereby it is articulated with the *Humerus.* b, b, The two Protuberances on each Side of it's Head. c, The Neck of the *Scapula.* d, A *Sinus* between the *Processus Coracoïdes*, and the Neck of the *Scapula.* e, The *Processus Coracoïdes*, of the *Scapula.* f, The *Processus Spinosus.* g, The Extremity of the *Processus Spinosus.* h, A Protuberance running forward from the *Processus Spinosus.* i, The Fore-part of the upper Edge of the *Scapula.* l, A thick spongy *Epiphyfis*, which (at the upper Edge of the *Scapula*) was separated by Boiling. m, The Angle at the Back-part of the *Scapula.*

Fig. 109. Represents the lower or Fore-part of the seven *Vertebrae* of the Neck.

Fig. 109.

a, b, c, &c. The lower or Fore-part of the Bodies of all the *Vertebrae.* b, b, The transverse Processes, which run obliquely forward. i, i, The transverse Processes of the 6th *Vertebra*, running both before and behind to guard the *Arteria Cervicalis.* k, A *Sinus* in the Body of the seventh *Vertebra*, for receiving a Part of the first Rib.

Fig. 110. Represents the Fore-part of the *Ossa Innominata.*

Fig. 110.

	Feet.	Inches.
A, The <i>Pelvis</i> in Circumference	4	6
B, The <i>Os Sacrum</i>		
C, The upper Part of the <i>Os Pubis</i>		
B, C, Between the <i>Os Sacrum</i> and the <i>Os Pubis</i>	1	6
D, E, From the Right to the Left of the <i>Pelvis</i>	1	5
		C, F,

	Feet.	Inches.
C, F, From the upper to the lower Part of the <i>Os Ilium</i>	1	
G, H, Betwixt the two outward Extremities of the <i>Offa</i> } <i>Innominata</i>	3	6
B, H, From the <i>Os Sacrum</i> above to the foresaid Point	2	9 $\frac{1}{2}$
From H to K	1	
L, The Circumference of the <i>Acetabulum</i>	1	6
E, H, Breadth of the <i>Os Ilium</i>	1	1
M, M, Circumference of the Neck of the <i>Ilium</i>	1	2
N, N, Breadth of the <i>Os Pubis</i>		8
O, O, The Length of the <i>Foramen Ovale</i> for the <i>Musculus</i> } <i>Marsupialis.</i>		5 $\frac{1}{2}$
P, P, It's Breadth		4
Q, Q, It's Circumference	1	1
R, R, The Breadth of the <i>Offa Pubis</i> before	1	5
S, T, The Length of the <i>Os Sacrum</i> , from where 'tis join'd with the <i>Vertebrae Lumborum</i> , to where 'tis join'd with the Tail.		

Fig. 111. Fig. 111. Represents the Back-part of the *Offa Innominata*.

A, The *Pelvis*. B, The Back-part of the *Offa Pubis* at their Articulation, where there is a large Cavity. C, C, The oval Hole for the *Musculus Marsupialis* fore-shorten'd. D, The Cavity for the *Acetabulum*. E, E, The Margin of the *Os Ilium*, which was separated by Boiling. F, The Back-part of the *Offa Innominata*, shewing their spinal and oblique Processes.

Fig. 112. Fig. 112. Represents the Back-part of the Fore-Foot.

a, a, The Bones of the *Carpus*, b, b, The Bones of the *Metacarpus*. c, c, The *Offa Seseamoidea*, whereof there are two upon the lower Extremity of each Bone of the *Metacarpus*. d, d, The Bones of the Toes.

Fig. 113. Fig. 113. Represents the Back-part of the Hind-Foot.

a, The *Talus*. b, Part of the *Astragalus*. c, c, Bones of the *Tarsus*. d, d, Bones of the *Metatarsus*. e, e, Bones of the Toes.

Fig. 114. Fig. 114. Represents the Bones of the *Carpus* separately.

1, The upper Surface of the external Bone of the first Rank of the *Carpus*. 2, The middle Bone. 3, The third Bone of the first Rank. 5, 6, The upper Surface of the three Bones of the second Rank.

Fig. 115. Fig. 115. Represents the Bones of the *Tarsus* separately.

1, The upper Surface of the *Astragalus*. 2, The upper Surface of the *Os Naviculare*, much enlarg'd in Proportion to the rest. 3, It's lower Surface. 4, 5, 6, The upper Surface of the *Offa Cuneiformia*.

Fig. 116. Fig. 116. Represents the concave Side of the Liver.

a, The *Vena Porta*. b, The *Vena Cava*.

Fig. 117, 118. Fig. 117, 118. Represent the *Os Hyoides*.

a, The Fore-part.

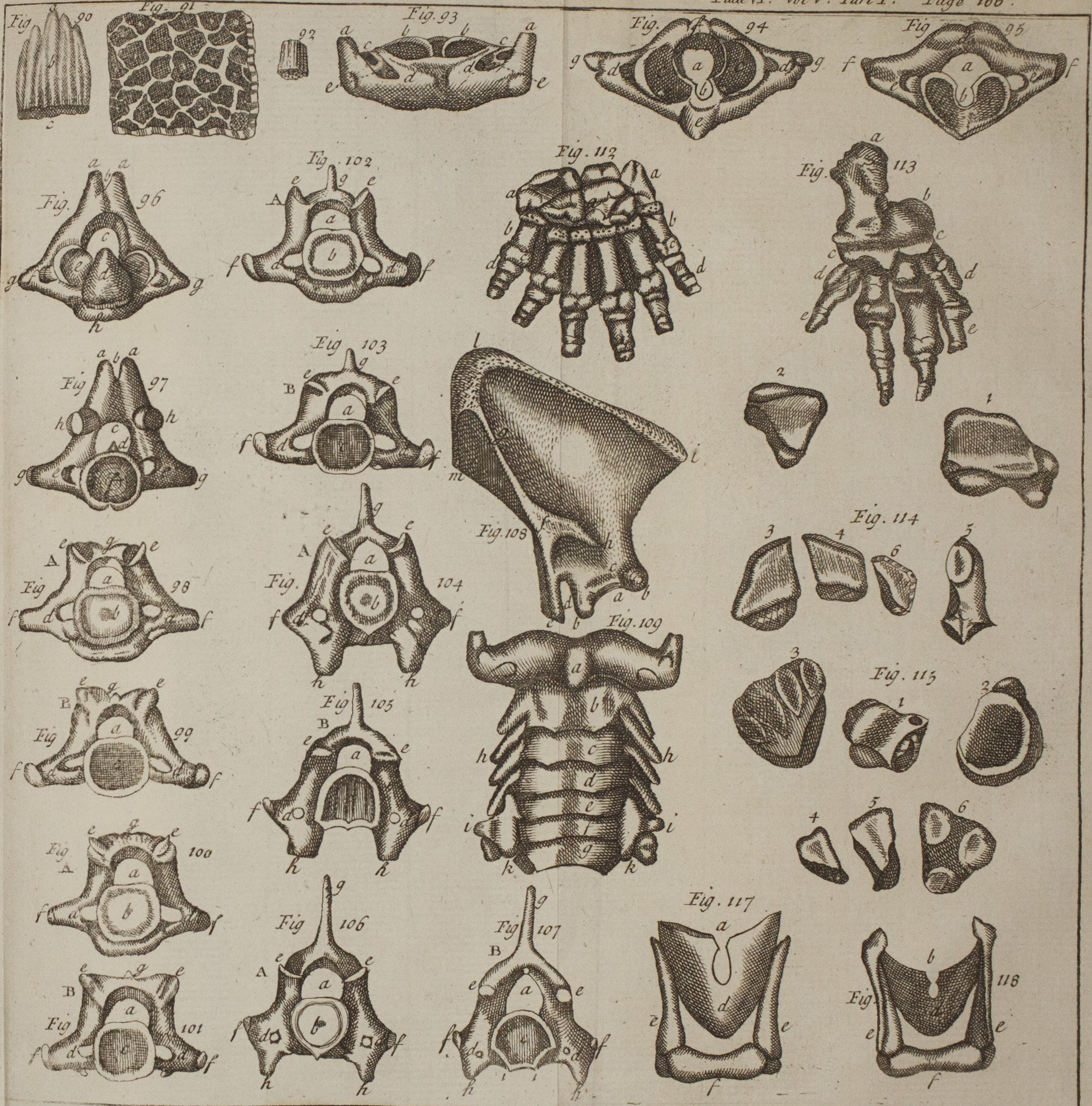


Fig. 118. *b*, The Back-part. *d, d*, The *Cartilago Scutiformis*. *e, e*, The lateral *Ossa Hyoidea*. *f, f*, The Bones of the Base of the *Os Hyoides*.

XXIV. Some Years ago an Elephant was shewn about at the *Hague*, the biggest that ever I saw. Casting my Eyes upon the hinder Part of her, in order to observe the *Matrix*, I could not discover the least Appearance thereof; whilst I was curiously viewing this great unweildy Creature, she made Water; but not like our four-footed Creatures, from whom their Water issues, as it were, in a Stream; for from this Creature it burst out all at one, just as if any Liquor were poured out of a Can, Top and Bottom all together: And I observ'd, that the Skin, out of which the Water flowed, was extended, or thrust outwards about the Space of three Fingers Breadth; and the Orifice, or Opening of the Skin in that Place, seem'd to be so large, that one might thrust one's Fist into it: And that Part from whence the Water was discharg'd, was not situated, as it usually is in our fourfooted Beasts, under the Tail, but in the Belly, and very near that Part where the Navel grows in our Creatures.

On the Parts of Generation in a Female Elephant, And Microscopical Observations on the Skin. By Mr. Leeuwenhoek, n. 363. p. 518.

This appear'd to me to be a very particular Discovery; the more, because I remember'd I had often read, that when the Time came for the Copulation of Elephants, the Female Elephant used to prepare herself a Bed with the Boughs of Trees, and then cast herself upon her Back on them; but none of the Authors that I had read gave their Reasons for her doing so.

Casting my Eyes upon the fore Legs of the Elephant, I observ'd growing upon the upper Part of the Body, or about the Breast, two Nipples, which in Cows we call Dugs, quite contrary to those of Mares, Cows, &c. whose Dugs are placed near the hinder Legs. But when we consider farther of the Matter, we must conclude, that Nature has so order'd it, in relation to the Elephant, for the Benefit of her young ones, which she could not have suckled, if her Dugs had been placed between her hinder Legs; for by reason of the Position of the Mouth under the Trunk, the young Elephant can't suck it's Dam; but the old one sucks at her own Breast, and by the Help of her Trunk conveys the Milk into the Mouth of the young one.

After this, I viewed the Skin of the Elephant, which was very rough; upon which, discoursing with the Keeper, I was told that that Roughness fell off every Year; and at my Request he scraped off a little of the said Skin upon a Paper.

On the Skin.

I always imagined that the most Part of it was a protruded Matter, which had not Nourishment enough to turn it all into Hair; and that what became Hair was very short and thin in proportion to the Bigness of so great a Body; and the Hair which is upon the Tail of the Elephant, is much thicker than that which is upon the other Parts of the Body. But as I more nicely view'd the scrap'd off Particles of the Skin, I discover'd in some of the Particles short
small

small Hairs, the Roots of which were sticking outwards in that Part which is joined to the Skin.

Fig. 119.

The Particles that were scrap'd off from the Skin of the Elephant, were crumbled into as small Pieces as are describ'd by *Figure 119*. A, B, C, D, E. A was a Particle on which there had been two Hairs, but by the Microscope one might discover four.

When these Particles were scrap'd off from the Skin, some of 'em were thick, and as it were united to each other; but they were easily divided into such Particles as are describ'd by the aforesaid *Fig. 119*.

This yearly shedding of Matter that is upon the Skin may be thus accounted for: When the Time comes that there is no Increase of the Hair, but that it is, as it were, at a Stand, as we see in other Creatures that shed their Hair, the same Thing happens to the Elephant; the Hair of which, as thin as it is, for the most Part falls off, and the incrusted Particles which stick to the Skin must also fall: And those Particles lay as close to one another, as if they were united, being surrounded with flattish Sides in the Manner they are shewn by *Figure C*, upon which there was remaining a small Particle of Hair or Wool.

Fig. 119.

Having nicely view'd one of those Particles that are describ'd by *Figure 119*. I discover'd on that Side which was next to the Skin several little Holes, in some of 'em 8, 10, 15, or more, according to the Bigness of the Particle; but when I view'd the same on that Side which was farthest from the Body, the said Holes were closed: And I observ'd in some few of those Particles small Hairs standing out, which run into an exceeding slender Point, agreeing with the Hairs of other Creatures, which are rubbed or cut off.

That I might the better discover the Figures of the said Matter, I slit some of the Particles (steep'd a little in boiling Water) with a sharp Penknife: I found nothing, only in such a Particle I met with 25 small Sands.

Fig. 120.

I took a Slice of one of the Particles describ'd *Fig. 119*. and which (as I said before) had a great many Cavities or Holes in it; and placing the same before a Microscope, caus'd it to be drawn, as in *Fig. 120*. F, G, H, I, and so it appear'd to the Painter tho' in my Eye it was larger: But I will not determine whether these little Holes were fill'd with Hairs when they were united to the Body, nor whether those Hairs stuck fast in the Skin, as to remain there upon the Separation of the aforesaid Particles.

Fig. 121.

I cut off a Slice from another Particle, and caus'd it to be drawn, as in *Fig. 121*. K, L, M, N. This Particle appear'd very wonderful to me, consisting of 10 Circles; each of which I fancied was produc'd at a different Time, and perhaps in a Month, according as the Matter was protruded from the Skin. When I cut a Slice out of the Middle of one of those Particles, describ'd *Fig. 119*. I could see no Holes

Fig. 116

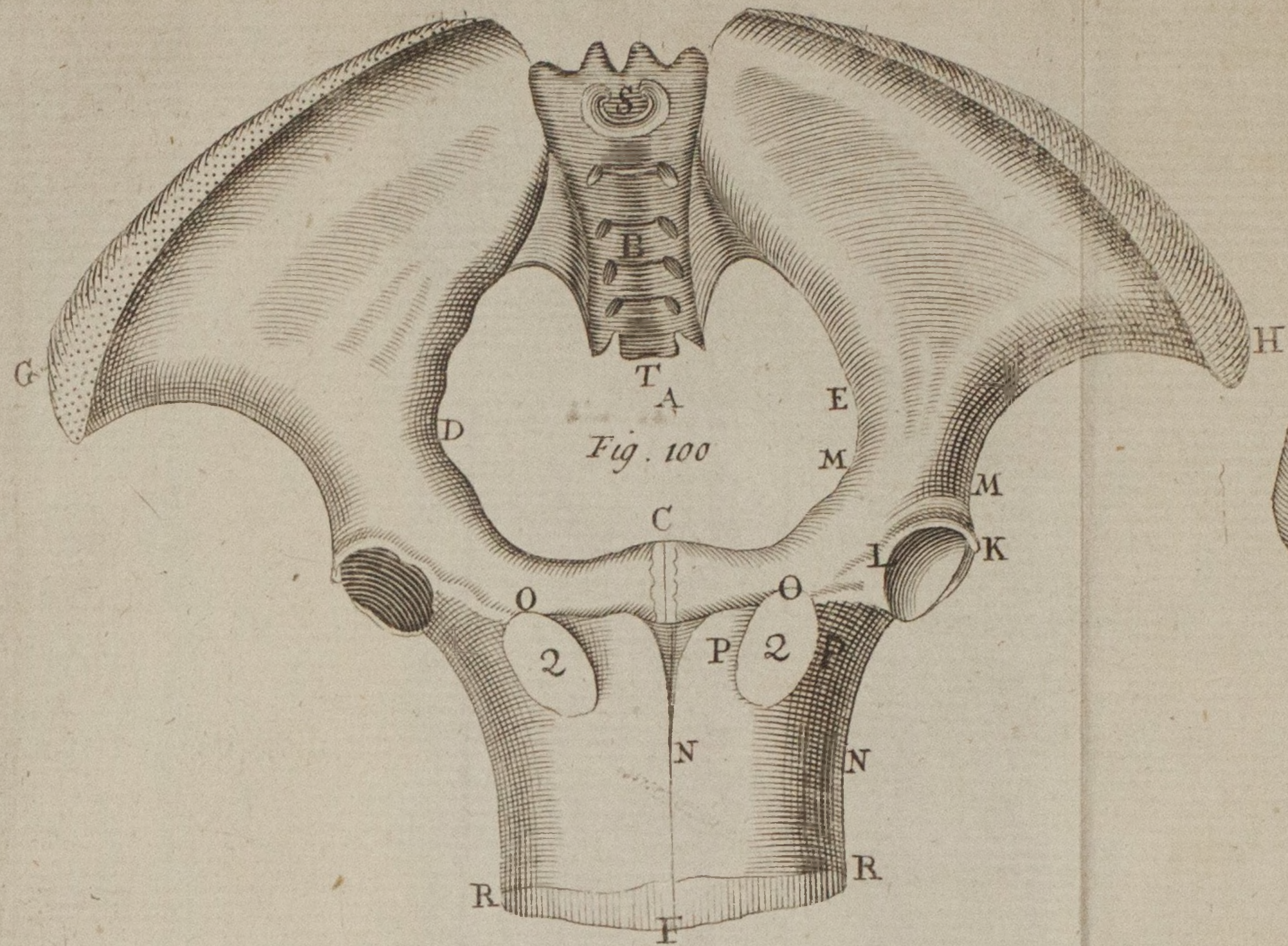
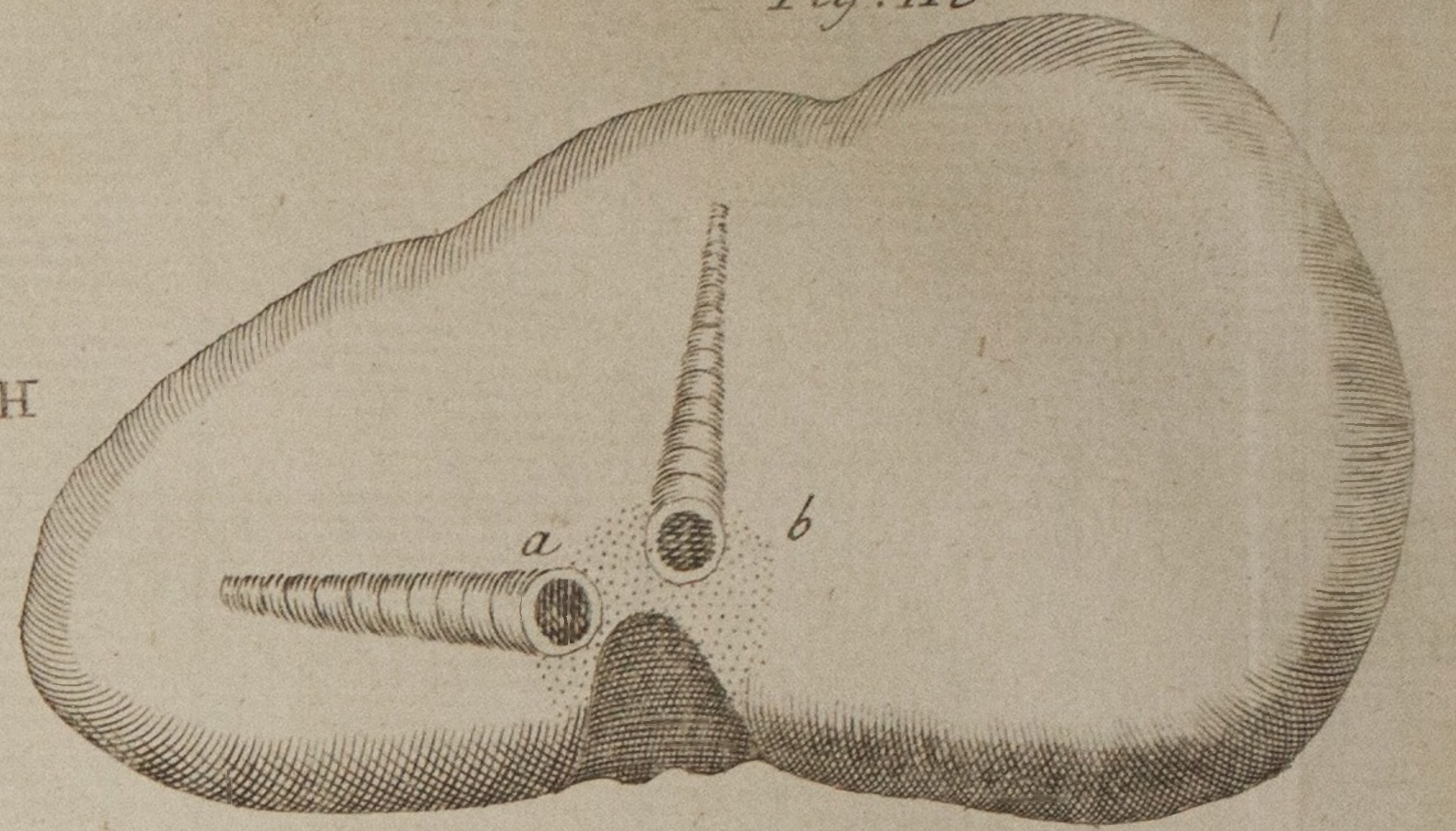


Fig. 121

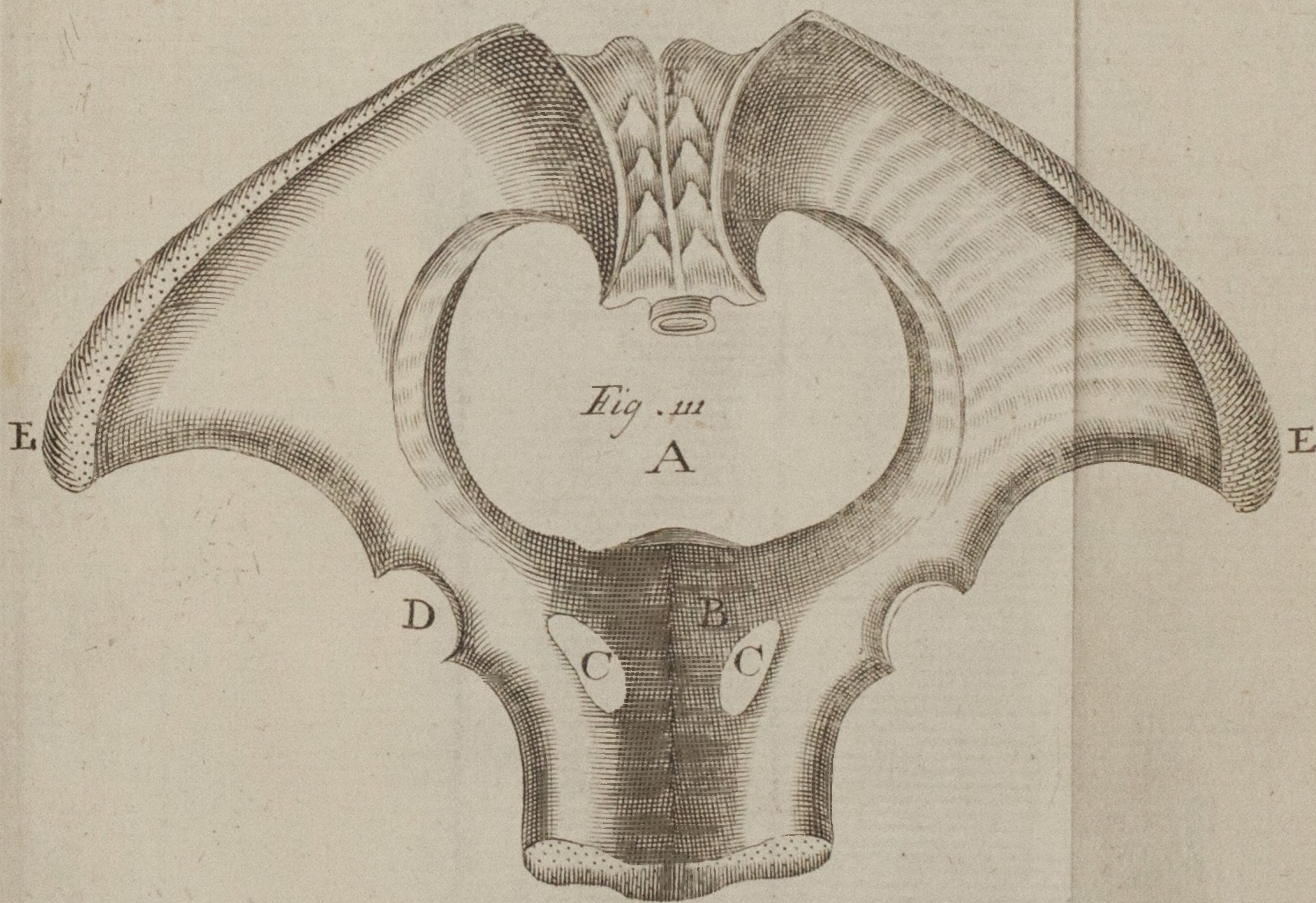
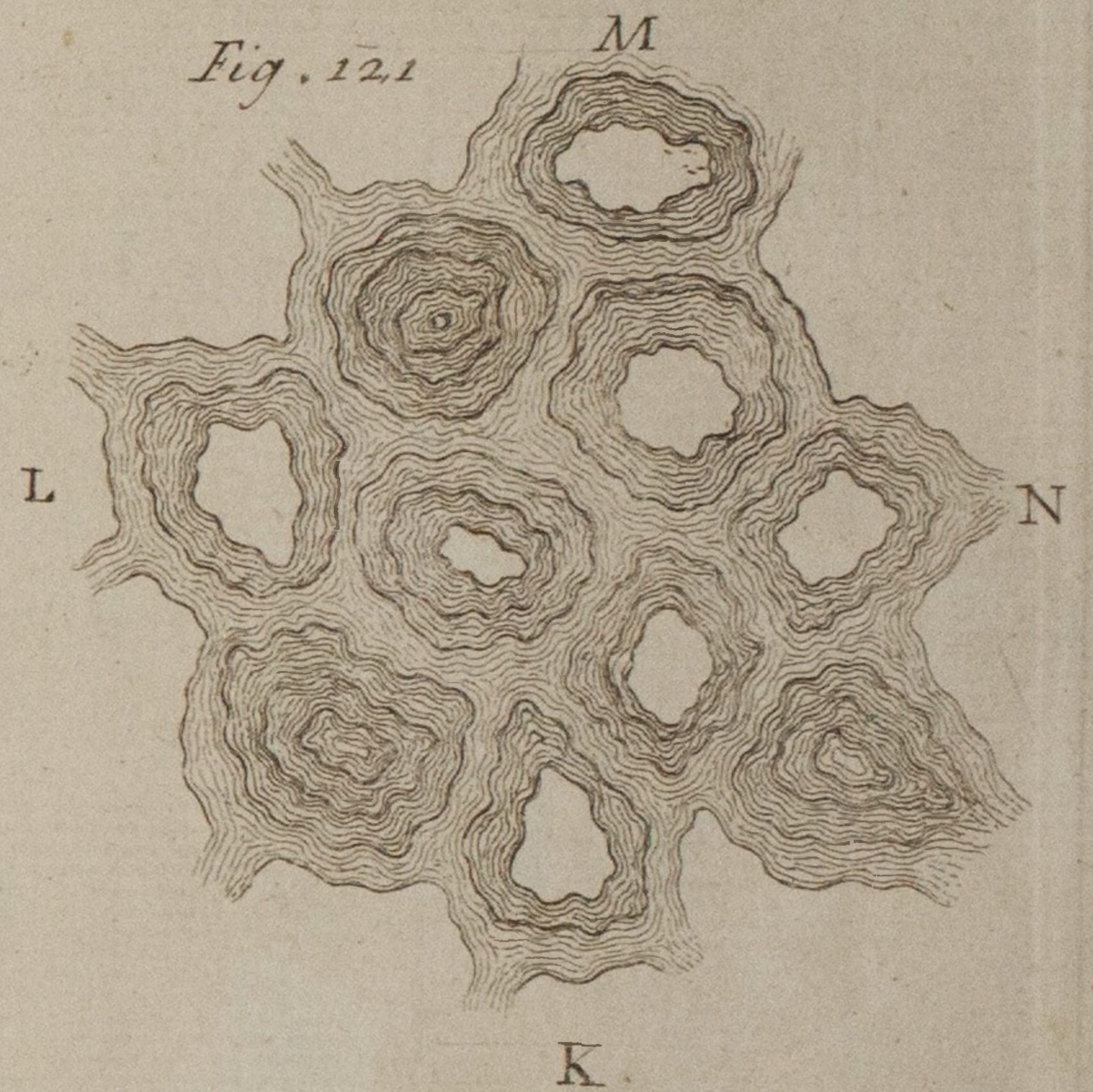


Fig. 120

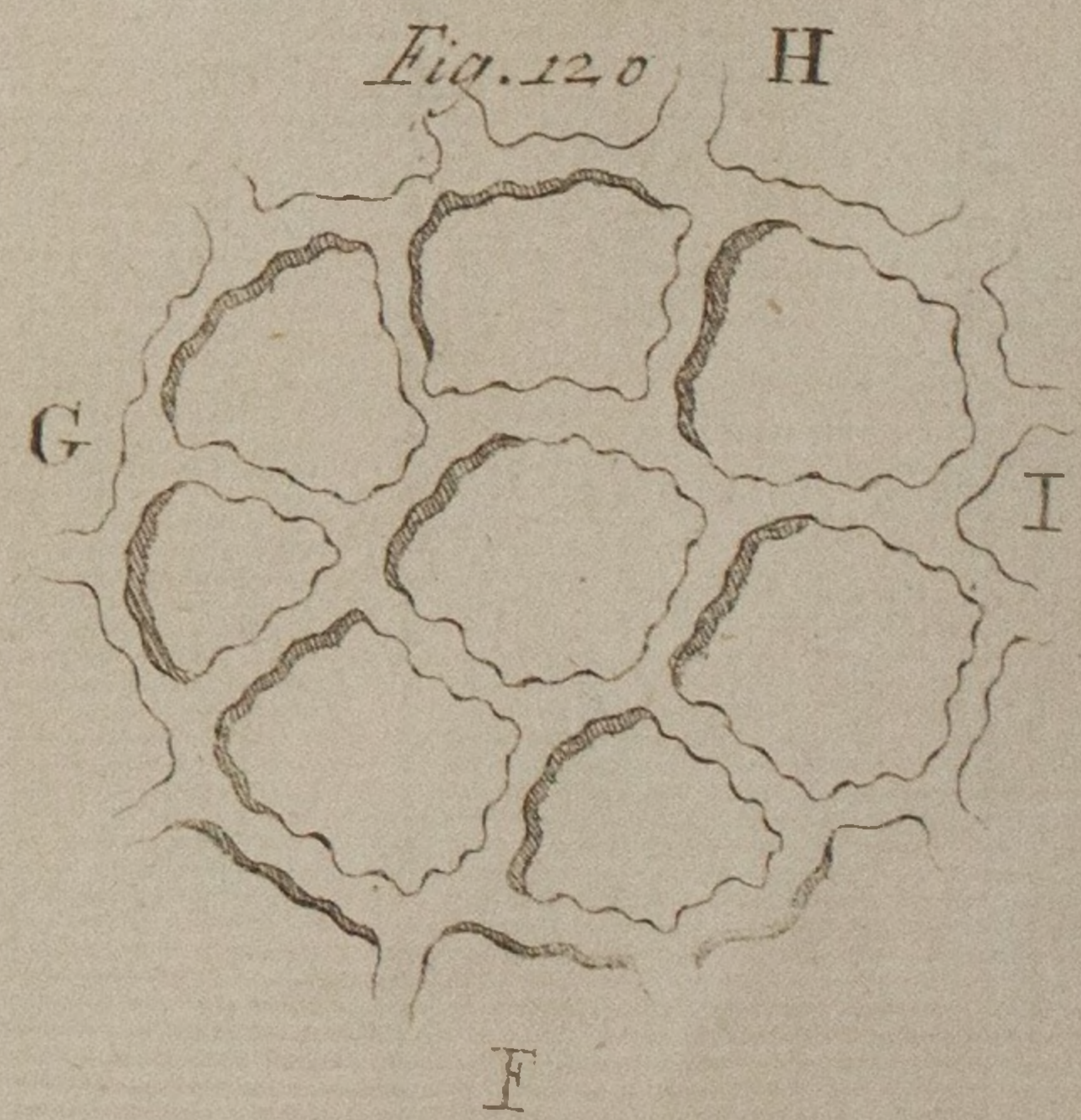
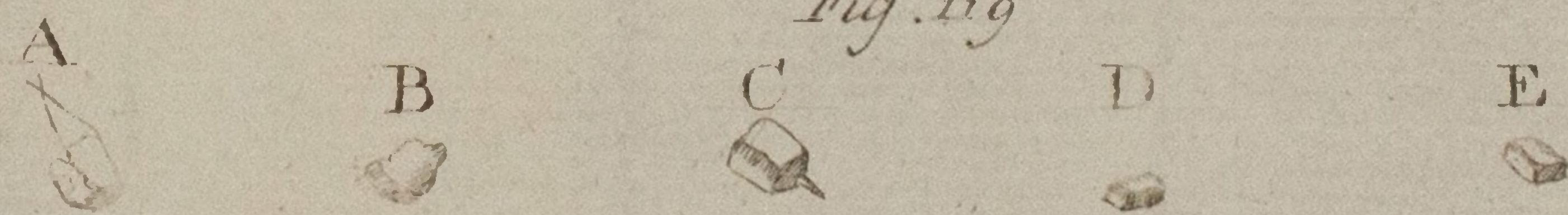


Fig. 119



Holes in it; neither could I, when I cut off any of the upper Part, discover the least Appearances that are describ'd, *Fig. 121.* which was occasion'd perhaps by the Elephant's rubbing or lying upon those Parts.

XXV. This *Male Opossum* was brought from *Virginia*, but falling from its Meat, it languish'd and dy'd: The Cause of its Death appear'd to be from a Mortification of the *Duodenum*, immediately below the *Pylorus*, which seem'd to arise from a Quantity of Hay that had been collected in the Stomach, and matted together in the Shape Dr *Tyson* describ'd, and figur'd the * hairy *Tophus* he found in the Stomach of that he dissected, but I could not find any Hair in this: This Wad of Hay slipping out of the Stomach, stuck in the *Duodenum*, which, together with the viscid Matter that involv'd it, compleatly obstructed the Passage in that Gut, as well as that of the Gall into the Gut, which appear'd from the Distension of the Liver, as well as Fulness of the Gall-Bladder. The *Omentum*, which in this Creature is only fastned to the bottom of the Stomach, had also suffered a *Gangrene*, as had almost the whole Canal of the Guts.

The Parts of Generation in a Male Opossum. By Mr W. Cowper, n. 29c. p. 1576. * Vide Supra, V. II. C. VI. S. CIX.

Besides the Organs imploy'd in Generation, the *Male Opossum* differs externally from the *Female*, there being no *Marsupium* or Pouch to receive the Young Ones, which Dr *Tyson* has given so exact a Description of; nor are there any Muscles inserted to the Skin of the *Abdomen* springing from the *Ossa Marsupialia*, as he calls the Bones, which may deserve the Name of *Hyoides*, from the Figure they make with the *Ossa Pubis* of this Animal; which Bones do not seem to differ in the *Male*, from those of the *Female* that Dr *Tyson* describ'd.

There is no external Appearance of Genitals in the *Male Opossum* *Fig. 122.* but the *Scrotum*, which is but just big enough to contain the *Testes*; nor could I readily discover any other *Foramen* outwardly in these Parts but the *Anus A*, which leads to the *Rectum*; but on withdrawing its Sides, I found another *Foramen B*, which, on Dissection, appear'd to be the *Præputium* or Out-let of the *Penis*. On compressing the Parts on each Side this *Cloaca A B*, I observ'd two Drops of yellowish colour'd Liquor (of the Resemblance of *Pus*) start out on each Side the *Anus c c*, which on further Examination I found came from two glandulous Bodies or Bags plac'd on the *Sphincter Muscle* of this Part. This Sort of Liquor Dr *Tyson* found in the Pouch of the *Female*, which, like this, had more of the peculiar *Fætor* of this Animal, than any other Part besides; for on removing these Parts with the Skin about the *Cloaca*, I was freed from the ungrateful Smell of it. On separating the Skin from the Muscles of the *Abdomen*, the two above-mentioned Bones (peculiar, I believe, to this Animal) appear'd, from whence some Muscles sprang, and were inserted to the *Ossa Femorum*, which perform'd the Office of the *Psoas* Muscles

Muscles in other Animals, which last-named Muscles were much smaller in this than in other Creatures.

The *Abdominal Muscles* were also fasten'd to the last-mention'd Bones, particularly the *Reēti*, which enabled this Creature to project or spring it's Body, especially in pulling it's hind Legs forward, with more Advantage or Force than other Animals, which are without these Bones.

Fig. 123, 124. Immediately under the Skin, about the *Cloaca*, I found a thin fleshy Muscle, inclosing the *Præputium*, and lower Parts of the *Reētum* and *Odoriferous Bags*, together with the four *Mucous Glands* M M, N N, at the Roof of the *Penis*, and Body of the *Penis* itself A; all which Parts were liable to be compress'd by the Action of this Muscle, especially when the *Penis* is erected, whereby it's Erection is sustain'd, by compressing the two external Veins on the *Dorsum Penis*, of which more hereafter, when I come to speak of the Manner the *Penis* of this Animal is erected. On removing this thin broad *Sphincter Muscle*, I was obliged to clear away two Lumps of hard Fat before the Body of the *Penis* could be discover'd; but we shall leave these Parts till we have clear'd the *Testes*.

Fig. 123, 124. The *Scrotum* being remov'd, each Testicle appear'd as represented on the Left Side Q T V, the *Vasa Præparantia* and *Deferentia* Q Q, being inclos'd in the *Cremaster* Muscles P P. These Muscles were proportionably very large in this Animal, as I have always observ'd them in Creatures that have no *Vesiculæ Seminales*, which is the Case of this Animal, and this Provision of Nature seems not only necessary to suspend the *Testes*, but these inclosed *Cremaster* Muscles also compress the *Epididymides* and *Vasa Deferentia*, and oblige them to dispatch their Contents (the *Semen*) into the *Urethra* in the time of *Coition*, which otherwise would have a slow Progress: But this Contrivance appears more peculiarly requisite in this Creature, because the Defect of the *Vesiculæ Seminales* here seems to be supplied by the Largeness of the *Epididymides* of the *Testes* W W, which are the Excretory Ducts of the *Testes*, and appear in this Animal to have a larger Bore than ordinary: For this Reason the *Tunicæ Vaginales* are very streight in this Animal, as appears in the Figure T V R R,

Fig. 123.

On discovering the Originations of the Spermatick Arteries, I was surpriz'd to meet with an Appearance I never heard of nor observ'd before; and in this I should not have had any Satisfaction, if I had not first injected Wax into the Trunks of the great *Artery i i i*, and *Vena Cava b*, below the *Diaphragm*. It seems the descending Trunk of the great Artery, below the emulgent Arteries in the Creature, is plac'd directly under the Trunk of the *Vena Cava*; nor does the Iliack Branches of the Arteries here, twine about those of the Veins, as in Human Bodies, and some Quadrupeds, which is done, perhaps, to compress the Channels of the Veins, by means of the Pulsation of these Arteries, to drive up the Blood in the Veins towards the Heart;

Heart ; but that Contrivance seems no Way necessary in this Animal, because the contrary Position of it's Body is more customary in hanging by it's Tail, with it's Head downwards : It is not unlikely, if the Veins of this Animal were examin'd below the Heart, which indeed I did not think of till those Parts were thrown away, but we should meet with some Contrivance to prevent the precipitate Flux of the Blood in that pendulous Position, as I have observ'd in the Trunk of the *Cava*, immediately above the Liver in Dogs : But to return to the Spermatick Vessels ;

The Arteries *a a* arise from the fore-part of the descending Trunk Fig. 123. of the great Artery, and pass thro' a very small Perforation* _____ made on Purpose in the *Vena Cava*, and descend straight to the *Testes*, as in Human Bodies, and are not contorted in their Progress, as we find them in most, if not all, Quadrupeds. This Perforation of the *Cava*, perhaps, was not only made for transmitting the Spermatick Arteries, but may also frame an *Annulus*, that may check the Velocity the Blood would otherwise have in those Arteries, which rapid Motion of the Blood, we find Nature studiously avoids in the *Testes* of all Animals : For in Men we see these Spermatick Arteries (contrary to all other Trunks of Arteries) are less at the Originations from the great Artery ; and in Quadrupeds (except in this) the Spermatick Arteries are contorted before they reach the *Testes*, as I have † elsewhere taken Notice. The Spermatick Veins, after leaving the *Testes* of this Animal, (like those of Human Bodies) have several Divisions and Inosculations, which are all reduc'd to one Trunk on each Side, and empty themselves into the *Cava*, immediately above the Perforation *b b*.

† Vid Infra. C. VI. §. iii.

Fig. 123.

Had the known Structure of the *Testes*, in Relation to their Excretory Ducts, been left undiscover'd 'till now, the bare Inspection of those Parts in this Animal would instruct us ; for on dividing the *Tunica Vaginalis* (R R), I found the inclosed Testicle and it's *Epididymis* lying loose, insomuch that they parted from each other as express'd W, X, Y, Z, and with the Assistance of a pretty large Convex Glass, I could see the *Excretory Duct* Z arising from one End of the Testicle, where the Spermatick Artery and Vein Y may be seen : After that Duct has march'd a little Way, it may be seen folded up into the Body call'd *Epididymis* W W, and at Length makes the *Vas Deferens* S S. In Men, and most, if not all, Quadrupeds, the *Epididymides* and *Testicles* cleave so to each other, that without some Dexterity in Dissection, the Rise of them from the *Testes* is not to be discover'd. This proves to us the Use of *Comparative Anatomy*, in detecting the Structure of Parts, which is very obscure in other Subjects, as well as in Human Bodies : But to return to the *Vasa Deferentia* S S, after they leave the *Preparantia* *a b*, as in Men and other Creatures, they grow somewhat larger, but on crossing the *Ureters* *e e*, become less again at their Entrance into the *Urethra*, immediately below the Neck of the Bladder, where their

Fig. 123, 124.

Their Orifices could be perceiv'd on each Side a *Caruncle*: Nor are there any *Vesiculæ Seminales* near the *Vasa Deferentia* of this Animal, as in Boars, Bulls, Horses, &c, which nevertheless cannot be allow'd to communicate with each other, as in Men: for tho' the *Vasa Deferentia* and *Vesiculæ Seminales* of those last-nam'd Animals empty themselves into the *Urethra* at the same Orifices with the *Vesiculæ Seminales*, yet their Communicant Ducts are so very short, that whatever comes by the *Vasa Deferentia* will sooner escape into the *Urethra*, than be received by the *Vesiculæ*, as in Men.

The Length of the *Urethra*, between the Bladder and the *Penis*, exceeded 4 Inches; more than 3 Inches and a half of which was inclosed with a glandulous Body, analogous to the *Prostrates* in Men and other Creatures: The Orifices of the Secretory Ducts of this Glandulous Body are very numerous, and open into the *Urethra* on all Sides, as appear'd on opening the *Urethra*; and compressing this Glandulous Body or *Prostrata*, I saw it's secreted Juice start out.

Fig. 123, 124.

This Part of the *Urethra* I K K L, thus inclosed with the *Prostrates* being very much contorted or folded, in it's Natural Situation between the Bladder and the *Penis*, when there is no Erection, must necessarily be drawn out, and becomes strait when the *Penis* is extruded, (which I shall shew by and by happens upon an Erection) by which Means this Glandulous Body is necessarily compress'd, and the *Succus Prostratarum* forc'd into the *Urethra*. The *Prostrata* of divers Animals are compress'd by Muscles fram'd on purpose that inclose them, as in Boars, Rams, &c. in Men they are compress'd by the *Musculi Levatores Ani*.

At the Root of the *Penis* of the *Opossum* we meet with 4 Glandulous *Vesiculæ* M M N N, two on each Side, which empty themselves into the *Urethra*, and contain a mucous Matter, like that I find in the Glands I lately discover'd in this Part in Man. These *Vesiculæ* are not only compress'd by the thin broad Sphincter Muscle above-mention'd, but the Bulbs of the Cavernous Bodies of the *Penis* C C, and *Urethra* E E, when distended, (in the Erection of the *Penis*) also compress these mucous Bags. This Compression is effected in Men by the Intumescence of the Bulb of the Cavernous Body of the *Urethra* *. In Boars, Rams, Cats, &c. we find Nature so sollicitous to discharge the Contents of the Excretory Ducts of these Glands, that (like the Gizzard of Birds) each mucous Gland is inclosed with a proper Muscle to compress it.

* Vid. Supra,
V. III. C. IV
§ C.

Fig 123, 124.

The *Penis* fell next under my Examination, the Fabrick of which appears not less surprizing than that which Dr *Tyson* met with in the *Uterus* of the *Female*; and in many Circumstances differ'd from what I have found in all the Animals that I have hitherto dissected: besides the forked Glands of it's *Penis* B B, it's Cavernous Bodies D D had no Connexion with the *Ossa Pubis*, nor did the Muscles call'd *Erectores* or *Directores* C C cleave to any Bone, as in Men and Quadrupeds, but all those Parts lay loose under the *Ossa Pubis*. The other Extremities of the two *Corpora Cavernosa Penis* are receiv'd into the Glands: Nor did the

the *Corpus Cavernosum Urethrae*, or it's Muscles E E cleave to the *Sphincter Ani*, as in most other Creatures, but the whole Body of the *Penis* lay loose between the Bones of the *Pubis* and the *Rectum*, so that on the Intumescence or Erection of the *Penis*, it is at Liberty to be extruded from it's *Præputium*, wherein it is secured from outward Injuries, when not erected. To favour this Extrusion of the *Penis* in this Animal, the *Urethra* I K L. is not only very long between it and the Bladder O O, but I found it much more contorted, or folded in acuter Angles, than is express'd in the Figures, else the *Penis* could not be extruded, but the Bladder O O must follow it: besides, it appears Nature design'd this Extrusion of the *Penis* of this Animal in it's Erection, because we meet with Instruments to withdraw it again into the *Præputium*. *ff* G shews a Pair of Muscles elegantly framed for that Purpose on the Fore-part of the *Penis*; they arise fleshy from the *Corpora Cavernosa Penis* D D, and becoming tendinous *ff*, as they pass thro' two Ligaments or Pullies on the *Ossa Pubis*, and are afterwards united into one Tendon G, which is inserted into the Upper-part, or *Dorsum Penis*. Besides this Pair of Muscles, (which is peculiar perhaps to this Animal) I found another Pair of Muscles H H, that also withdraw the *Penis*, arising from the *Rectum*, and are inserted into the Extremities of the *Corpora Cavernosa Penis*: In Cats, Male Porpoises, Bulls, Rams, and Boars, we meet with two Ligaments springing from the *Os Sacrum* or *Ilium* on each Side, and inserted into the *Corpora Cavernosa Penis* of those Animals, which, like these Muscles, serve to withdraw the *Penis* of those Creatures into the *Præputium*.

Fig. 124.

Fig. 123.

Fig. 123, 124.

Fig. 123, 124.

The *Corpora Cavernosa Penis* of the *Opossum* differ in their Figure from what we find in other Creatures; their upper Parts are bulbous D D, and cover'd with Muscles C C, like the Bulb of the Cavernous Body of the *Urethra* in Men: In other Animals, those Parts of the *Corpora Cavernosa Penis* are of a Conical Figure. The Muscles of the Cavernous Bodies of the *Penis* of this Creature having no Connexion with the *Os Pubis*, cannot apply the *Dorsum Penis* to the last-nam'd Bone, and compress the Vein of the *Penis*, whereby to retard the reflux Blood, and cause an Erection, as we have observ'd in other Creatures; but some large Veins of the *Penis* here, take a different Course, and pass thro' the middle Parts of the Bulb K K C, and are only liable to the Compression made by the Intumescence of these Muscles C C, that inclose them.

Fig. 125.

Fig. 123.

But the chief Agent in continuing the Erection of the *enis* in this Animal, is the *Sphincter Muscle* of it's *Anus*, or rather *Cloaca*, to which the broad *Sphincter Muscle* above-mention'd is continued, and does somewhat contribute. When the *enis* is extruded from the *Cloaca* (which must happen when it is erected) the *Sphincter* of that Part necessarily embraces it, the like must be done by the *Sphincter Muscle* of the *Cloaca* of the *Female* in Coition: On these Accounts I am apt to think these Creatures are not very quick in that Act: besides, the

Figure

Fig. 125.

Figure of the *Penis*, *Fig. 125*, shews an Unfitness for it's Retraction, 'till there is a Detumescence of it's *Glands A B*, which perhaps does not happen in these Creatures 'till both *Male* and *Female* are satiated, as in *Dogs* and other *Animals* that have *Bones* in their *Penis*, and have a *bulbous* Intumescence of the *Glans* in Coition, and no *Vesiculae Seminales*, as in this Animal, and also impregnate the *Female* with more than 2 or 3 at a time, as this does.

Fig. 123.

Fig. 125.

As the *Bulb* of the *Cavernous Body* of the *Urethra* in *Man*, is framed for the Use of the *Glans*, to keep it sufficiently distended when required; so it seems it is necessary to have two of those *Bulbs* inclosed with their particular *Muscles E E* in this Animal, to maintain the Turgescence of it's doubled or forked *Glans A B*, when the *Penis* is erected: In this Distension of the *Glans Penis* of this Creature, the middle Part of the Orifice of the *Urethra* (in which you see the Probe passing out of *Fig. 124*.) is necessarily compress'd, as represented *Fig. 125. D*, and two distinct Apertures *C C* are left, as appears by the last-mentioned *Fig. 125. A B*, on each Side it's forked *Glans*.

They that fancy an *Aura Seminalis* of the *Male* passes by the Way of the *Blood* of the *Female* to their *Ovaria* to foecundate the *Ova*, will here meet with an Instance I must leave them to solve: For to what End has Nature been at the Trouble of making double Emissaries for the *Semen* of the *Male Opossum*, tho' she design'd the Impregnation of a double *Uterus* of the *Female*? Certainly one passage in the *Glans Penis* would have been sufficient to convey the *Semen Masculinum* to the Mass of *Blood* in the *Female* in the Manner they conceive: Nature would never have been at the Trouble of all this Clutter in this Animal, in making a double *Glans*, and contriving two distinct Apertures in the *Glans*, when it's *Penis* is erected, if the Propagation of the Species had not depended on it: Doubtless it was for that End chiefly that the *Penis* of this Animal differs so much from what we meet with in other Creatures: Nor could the *Penis* of this Animal in these Circumstances, be expos'd in a Prepuce, as in other *Quadrupeds*, by reason of the numerous Accidents that would certainly attend it, in this Animal's Way of living: Nor could it's *Penis* been thus withdrawn, when not erected and sufficiently extruded, when it is if (as in other Creatures that are retromingent also) the *Penis* here had been fastened to the *Ossa Pubis*.

Fig. 124.

Thus we see Nature in these Instances does accomplish the same Ends by different Methods. Altho' there are no *Vesiculae Seminales* in this Animal, as in *Dogs*, *Weasels*, &c. yet we find it's *Penis* without a *Bone* in it, as in those Creatures; but then we meet here with additional Contrivances to maintain it's *Erection*: Not only the *Sphincter Muscle* of the *Cloaca* of the *Male Opossum*, but that of the *Female* also, so closely embraces it's *Penis* in Coition, and effectually retard the reflux *Blood* from it's *Corpora Cavernosa*, by compressing the *Veins*

of

of the *Penis* E. Nor could the *Penis* of this Animal be fram'd like that in Boars, Rams, Bulls, &c. in whom the *Corpora Caverosa* are too large, when not erected, to be secur'd within the *Cloaca* of this Animal.

Fig. 121.

Fig. 122. Shews the external Appearance of the Genitals of the Male Opossum.

Fig. 122.

A B c c, The *Anus* or *Cloaca*. A, it's lower Part, which leads to the *Rectum*. B, it's upper Part or Orifice of the *Præputium*, whence the *Urine* and *Penis* is extruded. c c, two small Apertures, whence the yellowish colour'd *Liquor*, that had the peculiar *Fætor* of the Animal, had it's *Exit*. D, the *Scrotum* just large enough to contain the *Testes*. E, that Part of the *Abdomen*, where the *Marsupium* is seen in the Female, which here appears a little more depress'd than in other Animals, but cannot retain the Young Ones, as does the Pouch of the Female. F F, the two *Thumbs* of the hind Feet, or *Hands*.

Fig. 123. The fore Parts of the Organs of Generation dissected from the Male Opossum.

Fig. 123.

A A, The Body of the *Penis*. A B, the forked *Glans*. C C, the Muscles analogous to the *Directores Penis* in Men and other Creatures, which here inclose the *Bulbi* of the *Cavernous Bodies* of the *Penis*. D D, the two *Corpora Caverosa Penis*, before they join and make the Body of the *Penis*. E E, Parts of the two *Bulbs* of the *Cavernous Body* of the *Urethra*. G f, f, a Pair of Muscles, whose two Tendons f f pass through two *Ligaments* or *Pullies* on the *Ossa Pubis*, and are afterwards united into one Tendon G, inserted into the *Dorsum Penis* and serve to draw the *Penis* within the *Cloaca*, after an *Erection*. H H, two other Muscles which serve for the same Use, and arise from the *Rectum*, but are fix'd to the opposite Part of the *Corpora Caverosa Penis*. I, the *Urethra*, where it has no glandulous Body inclosing it. K K, the *Prostratæ* or *Corpus Glandosum*, inclosing the *Urethra*, which lies contorted between the *Penis* and *Bladder* of *Urine* in the *Pelvis* of the *Abdomen* of this Animal. M N, two mucous Bags on each Side, at the Root of the *Penis*, which empty themselves into the *Urethra*. O O, the *Bladder* of *Urine*. P P, the *Musculi Cremasteres*. Q Q, the left *Cremaster* Muscle inclosing the *Tunica Vaginalis*. R R, the *Tunica Vaginalis* of the right Side, open'd to shew the inclosed *Vasa Preparantia* and *Vas Deferens*. S S, the *Vas Deferens*. T V, the *Tunica Vaginalis* inclosing the left *Testicle* with it's *Epididymis* V. WXYZ, The right *Testicle*, as it appear'd on opening the *Tunica Vaginalis*. W, it's *Epididymis*. X, the Body of the *Testicle*. Y, the *Spermatick Vein* and *Artery* as they pass to and from the *Testicle*. Z, the *Excretory Duct* of the *Testicle*, which could be distinctly seen arising from the *Testes*, and marching to the *Epididymis* W, where it is folded up and constitutes that Body, whence it is continued to the *Bladder* of *Urine*, and call'd *Vas Deferens* S S. a a, the *Spermatick*

Spermatick Arteries arising from the Fore-part of the descending Trunk of the *Arteria Magna*, where they have a common *Ductus*, which is divided as it passes thro' an Aperture * made on Purpose in the Trunk of the *Vena Cava*. *b b*, the Spermatick Veins at their Entrance into the *Cava*. *d d*, the Kidneys. *e e*, the Ureters. *g g*, the Emulgent Veins. Ψ Part of the left Emulgent Artery. *h*, the *Vena Cava* below the Liver. *i i*, the descending Trunk of the Great Artery. *k k*, the Mesenterick Arteries. *l*, the lower Mesenterick Artery, which in this Animal does not arise from the Great Trunk. *m*, the left *Glandula Renalis*, that of the right Side being plac'd behind the Trunk of the *Vena Cava*. *n*, a common Trunk of an Artery, from whence springs the Gastrick, the superior and inferior Mesenterick, and the Emulgent Arteries of this Animal. The Design of Nature in confining all those Arteries to one Trunk in this Animal, might be perhaps in favour of it's usual Posture of hanging by it's Tail with it's Head downwards. This Trunk of the Arteries of the *Viscera* of the lower Belly, having so many united Forces, is the less liable to any Compression that might be made by the contain'd Parts of the lower Belly in that Posture.

Fig. 124.

Fig. 124. The back Side of the *Genitals* of the Male Opossum. *A*, the Body of the *Penis*. *B*, it's Glans. *C C*, the *Bulbi* of the *Corpora Cavernosa Penis*, cover'd with their Muscles. *D D*, the *Corpora Cavernosa Penis*. *E E . . .* the two distinct *Bulbs* of the Cavernous Body of the *Urethra*, inclosed with their particular Muscles. *F F G*, Parts of the Muscles express'd on the Fore-part of the *Penis* in the preceding Figure. *H H*, the other Pair of Muscles springing from the *Rectum*, and inserted to the Sides of the *Corpora Cavernosa Penis*. *I K L*, the *Urethra* cover'd with the *Prostrata* *K L K*. *M N*, the two mucous Bags on each Sde. *O*, the Bladder of Urine. *P*, the *Musculus Cremaster*. *Q*, the *Tunica Vaginalis* open'd. *R*, *Vasa Præparantia* cut from the Great Trunks. *S S*, the *Vas Deferens* on each Side. *WXYZ*, the left Testicle, as in the preceding Figure, with the opposite Side here towards you. *e e*, Parts of the Ureters. **, a Probe inserted into Part of the *Urethra*.

Fig. 125.

Fig. 125. The Fore-part of the *Penis*, as it appears when it's *Corpora Cavernosa* are fill'd with Mercury and dry'd, figur'd half as big as the Life. *A B*, it's forked *Glans*. *C C . . .* the two distinct Apertures that appear in this Distension or Erection of it's *Corpora Cavernosa*. *D . . .* the middle Part of the Orifice of the *Urethra*, which is occluded on the Intumescence or Erection of the *Penis*. *E . . .* the two Veins of the *Glans*, which are compress'd by the two *Sphincter Muscles* of the Male and Female in Coition. *F*, the *Bulbs* of one of the Cavernous Bodies of the *Penis* distended. *G*, one of the *Bulbs* of the Cavernous Body of the *Urethra* also distended. These *Bulbi* were open'd on the other Side, Ψ to fill the Cavernous Bodies with Quicksilver, but are all express'd as they ought to appear on both Sides

Fig. 123.

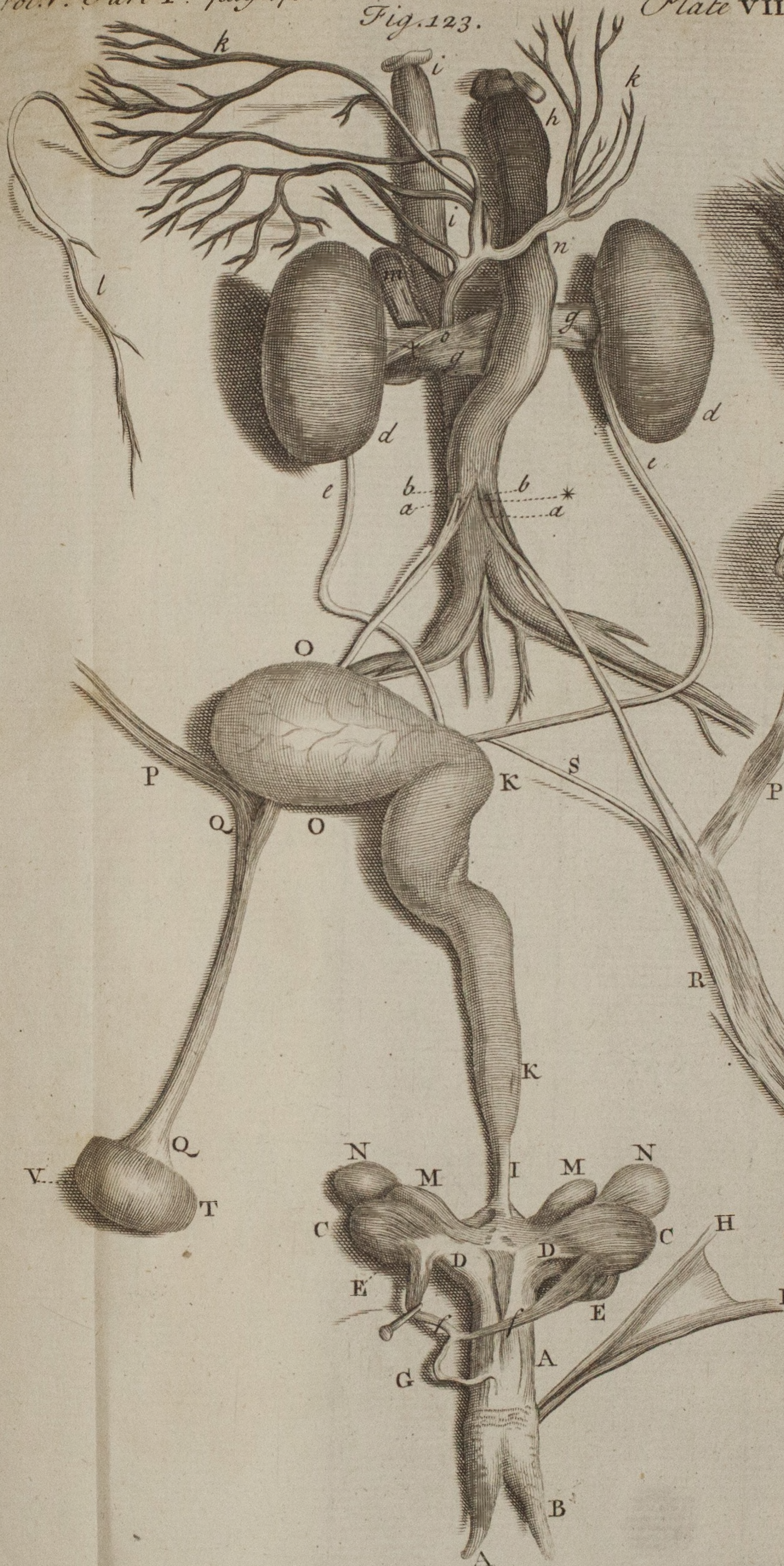


Fig. 122.



Fig. 126.

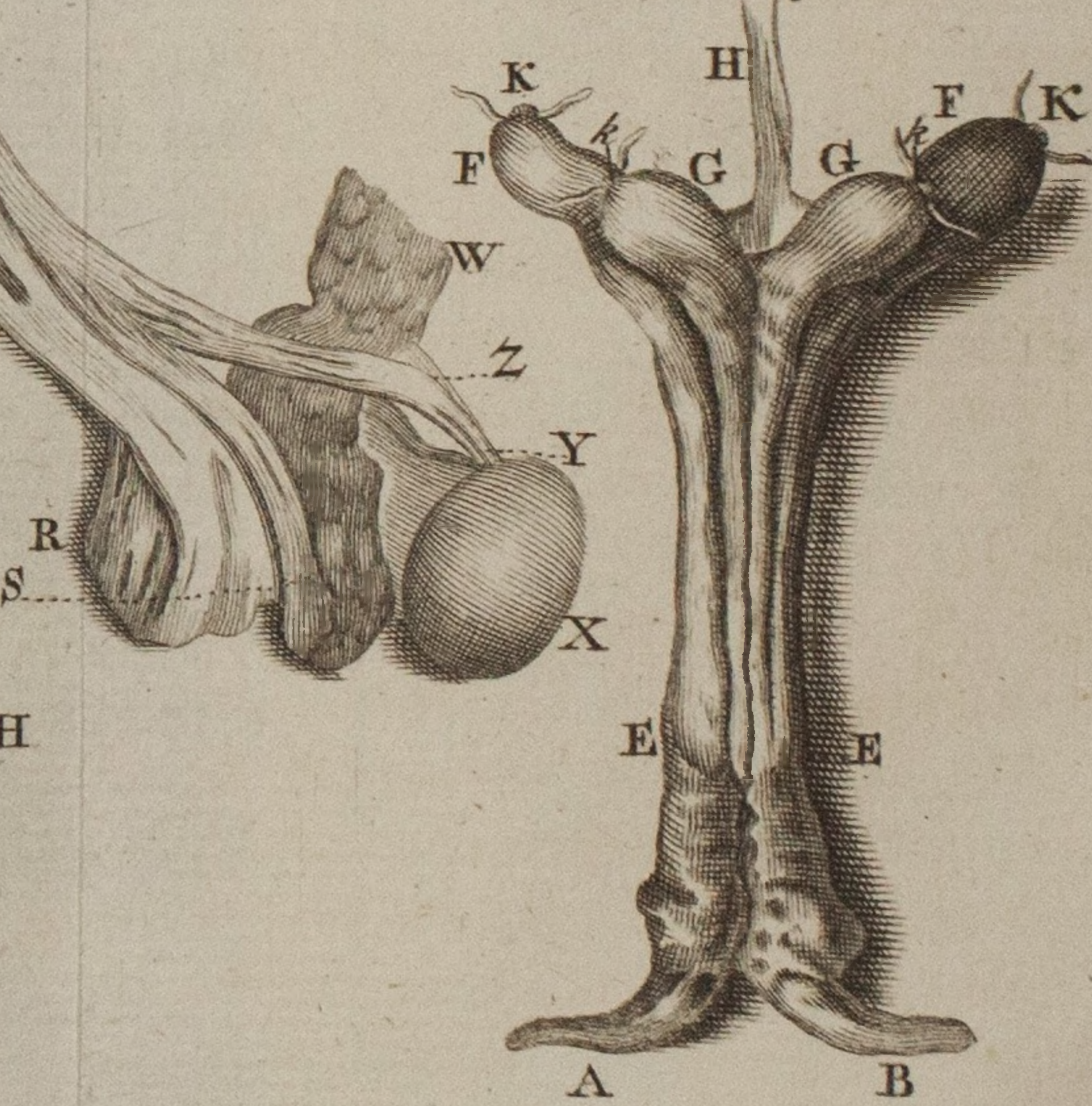


Fig. 125.



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Sides in the following Figure. H, The *Urethra*. I, The Muscles dried, express'd *Fig. 123*, and *124*, F, F, f, f, G. K, k, The Veins tied up to keep in the Mercury, as they pass the Muscles of the *Bulbi*.

Fig. 126. The Back-part of the *Penis* express'd in the preceding *Fig.* A, B, it's forked *Glans*. E, E, Parts of the Veins arising from the *Glans*. F, F, The Bulbs of the Cavernous Bodies of the *Penis*. G, G, The two Bulbs of the Cavernous Body of the *Urethra*. H, the *Urethra*, K, K, k, k, The Veins tied up, as they pass out of the *Bulbi* to keep in the Mercury.

Fig. 126.

XXVI. I formerly gave an Account in the *Philos. Trans.* N^o 239. † of the *Female Opossum* (as Mr *Cowper* has of the *Male* :) I shall add now only a few Observations for the farther illustrating the History of this *Animal*.

Observations on the Opossum. And a New Division of Terrestrial Brute Animals, by Dr E. Tyson, n. 290. p. 1565. † Vid. Supra. Vol. II. C. VI. §. CIX.

In describing the *Ears*, I had not an Opportunity of observing that *white Rim* that incircles them, which is very beautiful: for when in Health, for the Breadth of two Lines or more, there runs an *Edging* round the *Verge* of the *Ear*, of a perfect *Milk white* Colour. But the *Ear* here being so very thin and tender, 'tis easily affected by Cold or Illness, and then this white Part becomes jagged and crimped, as if burnt up, and the Whiteness disappears; as it happened in this last Subject before it's Death, as well as the first, which occasioned my not observing it then. 'Tis on this Account that *Margrave* in his Description of the *Tai-ibi* of *Brasil*, which now I take to be the *Male Opossum*, saith, it has *Aures subrotundas, molles, graciles, albas, teneras ut Charta, molles*, not that the whole *Ear* was *White*, but only the *Edges*.

But what I was most desirous to know, was, whether the *Male* had that *Marsupium* or *Pouch* for receiving the Young, as is affirmed by some I have named in my former Account. Mr *Cowper* in the Subject he dissected, neither observed the *Pouch* nor the *Muscles* belonging to it, as has been described in the *Female*: Nor indeed did I in that I dissected. Only this I took notice of when first I had it; that the *Skin* here seemed to be looser; so that with my Finger I could easily thrust it in, and by turning it round, could form for the present a *Pouch*; but this would easily turn out again, upon withdrawing my Fingers. Whether therefore 'tis capable of being formed into a *Pouch* or *Marsupium* upon Occasion, I shall leave as a Query to be resolved by those that live where they breed, Whether they ever observe the *Male* to receive the *Young* ones, as do the *Females*?

However, in the *Male*, there were those Bones I call *Marsupialia*, and I observed Muscles running from them to their hinder Legs, which no doubt, are very serviceable to them in drawing up their Bodies, as I find Mr *Cowper* has likewise remarked.

I shall further add, to confirm what *Oppian* and others I have named before, write concerning *Fishes* receiving their Young ones into their

Bellies; that Mr *Herbert* in his Travels (*Lib. 1. Pag. 23.*) saith, That in their Voyage they took a *Shark*, 9 Foot and a half long; and found in her *Paunch* 55 Young ones, each a Geometrical Foot in Length; all which, he adds, go out and in at Pleasure.

As to the *Brain*, I observed that being taken out of the *Cranium*, it weighed two Drachms and two Scruples. I did not find either in the *Cerebrum*, those *Anfractus*, or in the *Cerebellum* those *Circilli* which we usually meet with in other *Brains*. The whole was of an oblong Figure, and seem to be divided into three Parts, *i. e.* The *Cerebellum* the *Cerebrum*, and that part of the *Cerebrum* which was projected into the *Rostrum*. For by the pinching in of the *Cranium* here, the forepart of the *Cerebrum*, from whence issued the *Processus Maxillares* and *Olfactory Nerves*, was by this Constriction, remarkably distinguished from the *Cerebrum*; like an *Anterior Brain*. In the *Vermin* Kind, and those that have a long *Rostrum*, I have observed the like. For Nature here seems to give them more particularly the Advantage of the Sense of *Smelling*, for finding out their Prey, or avoiding the Danger they would shun.

So likewise I observed the *Optick Nerve*, as likewise the *Eye*, to be large; the better to look out for the one, or the other. And when I have mentioned the *Auditory Nerves* to be large likewise for the same Reason, to give them a quick Sense of hearing any sudden Noise, and so to avoid the Danger, these were the greatest Remarks I made upon the *Nerves*.

It was observed that it saw best in the Twilight, and not so well in the bright Sun; which I was easily brought to believe, because it was then to seek out for it's Prey.

In the *Eye* I observed the *Membrana Nictitans*; the *Glandula Lachrymalis* was large and oblong; there was the *Musculus septimus suspensorius*; and the *Crystalline Humour* was large, very transparent, and almost of a globular Figure; the *Eye* or *Iris* black.

A new Division
of Terrestrial Brute
Animals.
ibid. p. 1566.

In my Account of the *Male Opossum*, I queried to what *Species* in the Predicament of Animals this Creature might probably be reduc'd? Now having upon Dissection observed the *Penis* to be fleshy, and to have no *Bone* in it; I find it cannot be referred to the *Dog* or *Weasel* kind, as some have thought; and what *Piso* means by his *Glires majores montani*, to which he refers it, I shall not here enquire. I must confess we cannot be at a Certainty in this Matter, unless we had a more perfect Enumeration and Description of the several sorts of Animals that are in the World; and by a strict Enquiry into their *inward* as well as *outward* Parts, observed how gradually they differ from one another; by easy and gentle Steps, the intermediate *Species* linking the whole together. However till this can be attained, every little Help will contribute somewhat.

To give therefore my Thoughts on this Subject, I shall here propose a *Division* of such *Terrestrial Animals*, as have many *divided Claws* and *Nails* at the End of them into

Animalia { *Χειρο-δάκτυλα* seu *Manu digitata*, i. e. whose *Feet* resemble *Hands*, and have *Fingers*, rather than *Toes*.
Ποδο-δάκτυλα seu *Pede digitata*, i. e. whose *Digiti*, from the Order of their Position and Shortness, as also Uses, more resemble *Toes* than *Fingers*.

For tho' our Language make a sufficient Distinction between them, by calling one *Fingers*, the other *Toes*; yet the *Greek* and *Latin* do not; for *δάκτυλοι* and *Digiti* signify those on the *Hand*, and *Feet* likewise. To discriminate them therefore they are obliged to add another Word, as *Digitus Manûs*, or *Digitus Pedis*; which sufficiently justifies our Distinction of *Χειρο-δάκτυλα* and *Ποδο-δάκτυλα*.

Now we may observe these Differences between the *Fingers* and *Toes*, viz. that the *Fingers* are much longer, having usually a *Thumb* set at a Distance from the Range of the other *Fingers*; and are so contrived for the better holding what they have a mind to, and especially in these *Animals*, to assist them in *climbing* *Trees*, &c. for catching their *Prey*. Whereas the *Toes* are shorter, and are set in a more even Range together, and better contriv'd for swift *running*, by which way this other sort of *Animals* take their *Prey*.

This latter Sort we shall not insist on here, but rather give a *Sub-division* of the former, viz. Those *Animals* which have their *Feet* formed like *Hands*. Now where there is a *Thumb*, tho' we may esteem the *Hand* there more perfect, yet I find 'tis not always necessary; for in several *Animals* 'tis wanting, as will appear by the following *Scheme*; which I propose here only as an *Essay* or *Hint*, by farther *Observations* to be enlarged and amended.

The *Romack* therefore, tho' in the Head and Face much different from the *Monkey* Kind, yet being *Quadrumanous*, and on each *Hand* having a *Thumb*, I reduce under this Head. This Animal was brought alive from *Fort St George*. Whether it is described by any, or what other Names 'tis call'd by, I do not know. Hereafter, it may be, I may give a Description of this and some others of the *Ape* and *Monkey* Kind, in an *Appendix* to my Discourse of the *Ourang Outang*. And because in it's Face and Head it so much resembles a *Fox*, and in the rest of it's Body a *Monkey*, for the present I shall call it *Ἀλωπη-πίθηκος* *Vulpi-Simia*, or the *Fox-Monkey*. But the next I have mentioned in this Class, the *Coati* of *Brasil* and *Virginia*, or the *Rackoon* or *Rattoon*, tho' in it's Body it does not resemble the *Monkey* Kind, yet because it has Hands like a *Monkey*, as *Margrave* tell us, I place likewise here; as may be all others, whose *Feet* are all form'd like *Hands*, and have a *Thumb* in each.

For there are some that have not a *Thumb* on the *fore Feet*, and others that want one on the *hinder*.

In the Number of the former may be reckon'd the *Vantrevan*, the *Squirrel* Kind, and *Mouse* Kind, or any others that may be observ'd to have all their *Feet* form'd like *Hands*, only on their *fore Feet* do want a *Thumb*.

The *Vantrevan* (as 'twas call'd by the Person that shew'd it here in *London*) altogether resembles a *Monkey*, which on the *fore Feet* had only 4 long *Fingers*, and no *Thumb*. 'Tis a beautiful Creature, very brisk and nimble in Motion, and loving; has a very long *Tail*, by which it suspends it's Body, as does the *Opossum*.

The *Squirrel* Kind on the *fore Feet* have 4 long *Fingers*, on the *hinder* five, and one like a *Thumb*. It makes use of it's *fore Feet* like *Hands*, in holding up it's Food to it's Mouth, and lives on Trees, as do the *Monkeys*. But the Affinity between the *Monkey* and *Squirrel* Kind, does better appear by some *Monkeys* I have seen, which on the *Belly* have a large thick Fur, and a thick bushy *Tail* like the *Squirrel*; whereas usually on the *Belly* the *Ape* and *Monkey* are thinner of Hair, and that on their *Tail* is shorter. This Sort of *Monkey* I call therefore the *Squirrel Monkey*, or *Sciuro-Pithecus*, and have made a Figure of one of them; but it's *Face* more resembles a *Man's* or an *Ape's*, as likewise it's *Teeth*, and in these respects is much different from the *Squirrel* Kind.

Nearer to the *Squirrel* comes the *Mouse* Kind, which in the Shape of it's *Head*, the long *Teeth* before, and the large and prominent *Eyes*, more resembles the *Squirrel* Kind, and makes use of it's *fore Feet*, as *Hands*, in feeding itself, where it has only 4 *Fingers* without a *Thumb*, but on it's *hinder* has 5, of which the inwardmost and outwardmost are plac'd at a Distance from the Range of the 3 middle *Fingers*, like 2 *Thumbs*, as may be observ'd in some of the *Lizard* Kind.

Why we should include the *Cat* Kind in the Number of the *Animalia*, *Χειρο-δάκτυλα*, some may question, since their *Feet* seem rounder, and

and to have rather *Toes*, than *Fingers*. But we may observe that it uses it's *Fore-feet* like *Hands* in climbing and catching it's Prey; and when it does so, it exerts it's *Claws* and lengthens them; but when it uses it's *Feet* in going and running, it shortens them, that being most convenient for that Purpose, so that 'tis well provided for both, and it's *Digiti* are of a middle Nature between *Fingers* and *Toes*, as they are lengthened or shortened. And we may observe on each *Fore-foot*, is a *Pollex* or *Thumb* set at a Distance from the Range of the other *Claws*, whereby they more resemble *Hands*, and on the *Hinder-feet* there are only 4 *Digiti* without a *Thumb*.

We come next to those Animals that have only two *Feet* formed like *Hands*, and those are either the *Fore-feet* or the *Hinder*.

Those whose *Fore-feet* only are formed like *Hands*, have either a *Thumb* there, as the *Mantegar*, &c. or have only four *Fingers*, without a *Thumb*, as the *Cuandu*, &c.

The Mantegar.

The *Mantegar* is an Animal not described, as I know of, by any Author, and the strangest that I have seen. It is about the Bigness of a Mastiff Dog; it measured from the End of it's *Nose* to the *Anus* 3 Foot 2 Inches; the Girth of the *Body* 2 Feet 2 Inches; the *Head* 14 Inches long; the *Forehead* 5 Inches broad; the *Head* somewhat resembling an Horse's; the *Nostrils* large; the *Nose* of a deep *Cinnabar* Colour, and the *Bones* of the *Nose* depressed lower than those of the *Upper Jaw*, where the *Skin* was of an *Azure* blue Colour; a large Tuft of Hair on the *Forehead*, and likewise under the *Chin*; the *Fore-part* of the *Body* and *Inside* of the *Arms* and *Legs* almost bare of Hair, the Hair on the *Outside* of them, of a mottle Brown and Olive Colour; on the *Back* blackish: There were *Mammæ* on the *Breast*; an *Umbilicus*; and the *Præputium* without a *Frænum*, as in the *Ape-kind*: the *Præputium* of a *Vermillion* Colour; the *Scrotum* of an *Azure*; it had no *Tail*; 'tis very fierce, having 2 long *Tusks* in the *Upper Jaw*, and very lascivious; the *Fore-feet* perfectly resemble *Hands*, having long and thick *Fingers*, and a *Thumb*, and all the *Nails* of those *Fingers* flat; the *Nails* and the *hinder Toes* and *Fingers* imbricated, not flat; and tho' the *Claws* were pretty long, and somewhat imitating *Fingers*, yet the *Thumb* not so perfect, and the whole different from the *Fore-feet*. When sitting and supporting itself by a *Stick* in one *Hand*, being thus erect, and holding a *Cup* in the other, it would drink out of it, and not lap, it's Food was chiefly *Fruits*.

Amongst those Animals whose *Fore-feet* are like *Hands*, and have no *Thumb*, I reckon the *Porcupine* kind, as the *Cuandu* of *Brasil*, a sort of *Porcupine* described by *Margrave* and *Jo. Nieuboff* (*Voyages*, pag. 18.) which on the *Fore-feet* hath but 4 *Fingers* on the *Hinder* 5. Therefore, as *Margrave* observes, for want of a *Thumb*, it is but slow in climbing *Trees*; but the better to help himself, it twists it's *Tail* about a *Bough*, to save itself from falling. And much alike, if not the same, is the *Tlaquatzin Spinosum* of *Hernandez*. So the common *Porcupine*, before
has

has 4 Fingers, behind 5. So the *Tamandua* of *Brasil*, or *Ant-Bear*, before has but 4 Fingers, where the want of *Length* in the *Fingers*, is supplied by that of the *Nails*, and behind has 5 *Toes*. But I must confess there must be some Allowance made for ranging this *Anomalous Animal* (as Mr *Ray* calls it) here. But because he *climbs* *Trees*, and in doing this make use of his *Tail*, as some others here mentioned do, I was willing to put him into the *Croud*. And, unless it can be otherwise better ranged, we may likewise shuffle in here the *Ai*, *Ignavus* or *Sloth*, because it *climbs*, and lives on *Trees*, and has a *Head* not unlike an *Ape's*; and, as *Margrave* assures us, two *Teats*, on the *Breast*, but on each *Foot* had but three *Claws*, with very long *Nails*, like the *Tamandua*, and it's *Feet* being very narrow, and thus defective in *Toes*, 'tis very slow in *Motion*.

To conclude this *Scheme*, amongst the *Animals*, whose *Hinder-Feet* only are like *Hands*, is to be reckon'd the *Carygueya* or *Opossum*, which having described at large in the *Anatomy* of the *Female Opossum*, I shall not insist farther on it here; and if there be any other *Animals* that have their *Hinder-feet* formed like *Hands*, either with or without a *Thumb*, they may be reduced hither; my chief *Design* in this *Scheme* being (as near as I could) to include all those *Animals* that are observ'd to *climb* and *live* on *Trees*, into a *Class* together; and they being observ'd to have their *Claws*, either all or many of them form'd like *Fingers*, I place them therefore under this general *Title* of *Animalia Xsipro-dáxylula*.

XXVII. Papers Omitted.

1. Some Observations concerning *Insects* made by Mr *J. Banister* in n.270. p. 807. *Virginia*, A D. 1680, with Remarks on them. By Mr *J. Petiver*.
2. An Account of some *Animals* sent from the *Philippine Isles*. By n. 277. p. 1065. *G. J. Camelli* to Mr *J. Petiver*. By Mr *J. Petiver*.
3. An Account of some *Animals* sent from *Fort St George*. By Mr n.271. p. 843. *E. Bulkeley*, to Mr *J. Petiver*. By the same.
4. An Account of some *Animals* sent from *India*. By the same. n. 276. 1023.
5. *G. J. Camelli* Observaciones de *Avibus Philippensibus*. n. 285. 1394.
6. *G. J. Camelli* de *Piscibus*, *Moluscis*, & *Crustaceis Philippensibus*. n. 302. 2043.
7. *G. J. Camelli* de *Quadrupedibus Philippensibus*. n. 305. 2196.
8. *G. J. Camelli* de *Monstris*, quasi *Monstris* & *Monstrosis*; item de n. 307. p. 2266. *Serpentibus*, *Viperis*, &c. *Philippensibus*.
9. *G. J. Camelli* de variis *Animalibus Philippensibus*. n.318. p.241.
10. *G. J. Camelli* de *Araneis*, & *Scarabæis Philippensibus*. n. 331. p.310.
11. An *Extract* from the *Acta Eruditorum*, for the Month of *March* n. 338. p. 46. 1713, pag. 111.] De *Contagiosâ Epidemiâ* quæ in *Patavino Agro*, & tota fere *Veneta Ditione*, in *Boves* irrepsit *Dissertatio*. Auctore *Bernardino Ramazzini*, *Practicæ Medicinæ Professore Publico*. *Patavii*, 1712. *Octavo*.

CHAP II.

ANATOMY, DISEASES.

A General Paper, and of the Skin.

Observations
in a Course of
Anatomy of
Marchetti's at
Padua by the
late Mr J.
Ray, communi-
cated by Mr
S. Dale. n. 307.
p. 2282.

I. **O**BSERVATIONS upon a Body dissected at *Padua* by *Marchetti*, begun the Tenth of *December* 1683.

He began the Dissection in the same manner as Anatomists commonly do, *viz.* by cutting the Skin of the Belly in the form of a Cross, but without touching the Navel.

He separated the *Scarf Skin* from the Skin by holding a lighted Candle to the Skin, which made the Cuticle rise into a Blister, whereby he easily separated it with a Knife. The Cuticle cannot be separated from the Skin unless by Blistering, either with the actual or potential Cautery.

Under the *Skin* a great deal of *Fat* half an Inch thick surrounded the whole Abdomen. The *Fat* was kept firm by a great many small Fibres, like so many *Fulcra* to support it, and hinder it's running off.

Under the *Fat* was the *Membrana Carnosa*, which however in this Part did not appear fleshy: There was likewise under this Membrane some *Fat*, but very little. This Membrane he affirmed to be double in Brutes, because they are able to move and wrinkle the whole Skin; in Man it is likewise double upon the Forehead, and hence he can contract and wrinkle it; in some People too it is double on the hind Head, whereby they can move the whole Scalp. *But others assign a different Reason for those Motions, viz. because both in the Fore-head and Occiput the Membrana Carnosa adheres firmly to the Skin, and degenerates into a Muscle, which is more probable than the other.*

Next he went on to the *Abdominal Muscles*, and first of all to the *descending Oblique*, which arising from the Middle of the false Ribs by so many Digitations, are adapted to the like number of Digitations of the *Musculus Serratus Anticus Major* of the Thorax, after the same manner as the Sutures of the Bones. In the back Part the *latissimus Dorsi* Muscle lies upon it, and therefore he was obliged to raise it a little first.

The *Musculi Recti*, connected by a broad Tendon to the Eminences or Processes of the *Ossa Pubis* arise above on each Side by nervous Tendons, from the Cartilage of the first fallen Rib, near the *Cartilago Ensiformis*.

The *Ascending Oblique Muscles*, arising by radial Fibres from the upper Margin of the *Os Ilium*, receive a musculous Vein from the Branches of the *Iliacks*. Secondly, these same *Oblique Muscles* in which there was nothing

nothing singular, arise from the Top of the *Os Ilium*, and have a double Tendon, which embraces as it were the *Musculi Recti*: viz. one Part of it lies upon the *Musculus Rectus*, and before it has got over half the breadth of that Muscle, coheres firmly, or rather is united into one, with the Tendon of the descending Oblique Muscle, so that it is impossible to separate them from one another; while the other Part, passing under the *Musculus Rectus*, coheres in the same manner with the Tendon of the transverse Muscles of the Abdomen. It receives a Vein from that called *Muscula*, which is a Branch of the *Iliack*.

The *Musculi Recti*, had only two tendinous Interruptions, whereas in some Bodies they have three, in some four, and in some five, as *Veslingius* observes. In these Muscles, we observed the Anastomoses of the internal Mammary and Epigastrick Veins.

The *Transverse Muscles* arise from the Processes of the Vertebra of the Loins; but as he observes, the ascending oblique Muscles of the Abdomen are not connected to these Vertebrae.

We likewise observed in this Body the *Pyramidal Muscles*, lying obliquely upon the *Recti*.

Obs. 1. The Fat upon the Back is more fluid and soft in Women than in Men.

2. The Skin in those that have bore Children is wrinkled about the Iliæ, but in Virgins it is not so.

3. A Vein, Artery, and Nerve, always accompany one another, the Artery running upon the Right, the Vein in the middle, and the Nerve on the Left.

4. Under the Muscles upon the Peritonæum near the Loins we observed a great deal of Fat, whence in this Part the Muscles are easily separated from the Peritonæum, but near the Linea Alba this Membrane coheres so firmly with the Tendons of the Muscles, that it is impossible to separate them from one another.

5. He affirmed that the Muscles in their Origins or Heads are tendinous.

6. He began to dissect the Muscles from their Heads or Origins; because by this the Motion or the Use of a Muscle in it's Motions is more easily discovered.

7. Surgeons ought to take Care not to cut the Muscles across their Fibres, because thereby there is Danger, least by cutting the Nerves, (which always run parallel with the Muscular Fibres) Convulsions should be brought on.

8. Whoever wants to dissect and separate the Muscles nicely, ought accurately to observe the Fibres, and follow their Directions.

9. The Transverse Muscles both at their Origin and Infertion have a broad tendinous Membrane.

Next he shewed the *Vertebrae* of the *Loins* five in Number; and each of them having seven Processes, viz. one Spinal, two Transverse, two oblique Ascending, and two oblique Descending. The oblique Ascending

ing of the lower *Vertebræ*, is articulated by *Ginglymus* with the oblique descending of the contiguous one above it; but the *Vertebræ* themselves are connected by *Harmonia*, viz. the Cavity of the upper one receives the Protuberance of the one next to it below.

The *Os Sacrum* is composed sometimes of six Bones, but commonly of five. When of six, the *Os Coccygis* has only three Bones, when of five it has four. The *Os Coccygis* is crooked below for more convenient sitting.

In difficult Labour, the Surgeon by thrusting his Finger up the *Rectum*, and pulling back the *Os Coccygis*, may facilitate the Birth; which *Marchetti* affirms he has done himself.

The *Os Sacrum* has large Foramina for the Nerves to go out at.

He asserts that these Bones which constitute the Pelvis, are not larger in Women than in Men in Proportion to the Bulk of the Body, as other Anatomists affirm.

The *Os Ilium*, the *Os Pubis*, and the *Os Coxæ*, or *Ischion* in Adults, grow together as it were into one Bone, but in Children they are distinct, and connected by a Cartilage. All these three Bones join together in the *Acetabulum*, and each of them helps to constitute a Part of it. He distinguished the *Os Ilium* into the Margin, the Spine, the Back, and two Sinuses, viz. the upper, upon which a Nerve going out from the uppermost Foramen of the *Os Sacrum*, passes as it descends to the Thigh; and the lower between the two Eminences for the Convenience of sitting.

The Nerves go out at the Sides of the *Vertebræ*, by the Foramina formed between each of the two *Vertebræ*.

He shewed the Bowels and Intestines in their natural Situation; viz. the *Colon* surrounding all the Intestines; the *Cæcum* on the right Side about the Bigness of one's little Finger, and he asserted that he had never found it neither larger, nor full of Excrements in Fœtuses nor in Infants. Immediately above the *Cæcum* begins the *Ilium*, which is both larger and full of Fæces. Next comes the *Jejunum*, which is both more fleshy, red, and vascular, and void of Excrements. The *Duodenum* terminates at it's Flexure.

That Part of the *Mesentery* to which the *Colon* is connected is called the *Mesocolon*; the rest of it to which the small Intestines are attached κατ' ἐξοχὴν by way of Pre-eminence, is called *Mesentery*. The lower *Mesenterick Artery*, scatters Branches through the whole *Colon* and also the *Rectum*, whence the *Hæmorrhoidal Artery*; the rest of the Intestines are supplied from the upper *Mesenterick Artery*.

The *Spleen* in this Body was larger than natural; which he attributed to drinking.

The *Colon* adhered to the *Peritonæum*.

The *Pyramidal Muscles* arising on each Side from the Processes or Eminences of the *Os Pubis*, and ascending obliquely, terminate by their contiguous Tendons in the *Linea Alba*. The Use of these Muscles is to
expel

expel the Urine by compressing the Bladder, according to *Fallopian*, when they are wanting (as is sometimes the Case) the Extremities of the *Musculi Recti* are broader.

He shewed us besides the *Umbilical Vein*, which is inserted into a Fissure of the *Liver*, and degenerates into a *Ligament*, the *Umbilical Arteries*, which being connected to the *Peritonæum* run as far as the *Iliack Branches* of the great Artery: And the *Urachus*, which being likewise connected to the *Peritonæum* descends to the Bottom of the Bladder, and supports it, as also in Man it performs in some Measure the Use of a *Ligament*, and is not quite perforated.

He shewed us likewise the *Tubes* of the *Womb*, the *Round Ligaments*, the *Female Testicles* or *Ovaria*, the *Spermatick Vessels*, and also the *Broad Ligaments*.

The *Broad Ligament* of the *Liver*. This Viscus in living and sound Persons does not lie upon the Stomach, and therefore Ointments, Fomentations and Epithems, may very fitly be applied externally to the Region of the Stomach.

The *Round Ligaments* of the *Womb* perforate the *Peritonæum* and all the Muscles, and afterwards dividing send one Branch to the *Clitoris*, and another down the Thigh.

He shewed us the *Gastrick* and the *Gastro-epiploick Veins* and *Arteries*, accurately dissected; but in these he does not altogether agree with *Veslingius*, whom I attended.

Obs. 1. *Buboes* are sometimes produced in Persons who are chaste, but in these they may be discussed without a Suppuration: On the contrary, your *Venereal Buboes*, unless a *Gonorrhœa* comes on, always suppurate.

2. We observed a Valve in the beginning of the Colon; and *Marchetti* asserted from his own Observation, that the *Iliack Passion*, or *Volvulus*, is owing to an Inflammation of that Valve, which hinders the Excrements from passing downwards; for he had seen that Foramen shut up so very close, as not to admit the Point of a Needle.

The Veins of the Stomach are either proper or common. The proper are, 1. The *lesser left Gastricks*, three or four in Number, (the first and shortest of which is called the *Vas breve*) arising from the *Splenick Branch* of the *Vena Portarum* near the Spleen. 2. The *greater left Gastrick*, or *Coronary*, because it is spread upon the upper Part of the Stomach in form of a Crown. 3. The *right Gastrick*, or *Pylorick*. The common are, 1. The *left Gastro-epiploick*, which arising from the *Splenick Branch* near the Spleen gains the *Fundus* of the Stomach, sends off several Branches both to the Stomach and *Omentum*, especially one remarkable one to the *Omentum*, called the *left Epiploick*. 2. The *right Gastro-epiploick* arising in this Body from the *Mesenterick Branch* near the Pylorus, and gaining in the same manner as the former the Bottom of the Stomach, is first spread upon the Stomach, and then upon the *Omentum*, it's greatest Branch or Trunk being joined by Anastomosis with the right

Gastro-epiploick. This is a very considerable Vein, and sends off one Branch a good deal larger than the rest called the right *Epiploick* Vein.

In the Bottom of the *Gall-Bladder* there are no conspicuous Vessels which convey the *Gall* to it, but only certain Porosities which allow it to pass, and besides when the *Gall-Bladder* is separated from the *Liver*, the bilious Humour manifestly transudes. Further there are some Capillary Veins going from the *Parenchyma* of the *Liver*, spread upon the Membranes of the *Gall-Bladder* in such a manner, that there is no separating it from the *Liver* without an Effusion of Blood. He asserts that the *Gall-Bladder*, when it is conjoined with the *Liver*, consists only of a single Membrane, but elsewhere it is double.

The *Meatus Cysticus*, where it terminates in the common Duct, has no Valves, but only a narrow Mouth, to hinder the reflux of the *Bile*.

The *Liver* has three Sinuses, one in which the *Gall-Bladder* is situated, another into which the *Umbilical Vein* enters, and a third where the Trunk of the *Vena Cava* passes.

The *Gall-Bladder* has a large Artery, but very small Veins. He said he had observed that when the Artery was large, the Vein which answered to it was small; *But I do not believe it.*

Opinions of
Marchetti,
which to me
do not seem
probable.

1. He asserts likewise, that when the *Meatus Cysticus* is obstructed, the yellow Jaundice is produced, and when the *Porus Cholidochus*, the Black.

2. That the Vessels of the *Vena Portarum* and *Cava* in the *Liver* are not joined together by their Mouths, but by Harmonia, or mutually lying upon one another.

3. That the *Vena Portarum* does not put on a new Membrane within the Substance of the *Liver*.

4. That he has seen *Lacteal Veins* inserted into the Trunk of the *Vena Portarum*.

5. That he could never find out nor believe that there was a common *Receptacle* of the *Chyle*. *I know the contrary from my own Experience.*

6. That he had seen a considerable Branch of the *Lacteal Duct* terminating in the *Pancreas*.

7. That he thought the Use of the *Spleen* was to separate the *Black Bile* from the *Blood*, and to transmit it together with the *Blood* to the *Liver* by the *Splenick Vein*, whence it was sent off into the Intestines by the *Meatus Cholidochus*.

8. That he imagined the *Lacteal Veins* sucked the *Chyle* from the Intestines, and carried it to the *Pancreas*, the Use of which was to perfect and exalt it farther, and to throw off the excrementitious Part of it into the Intestines by *Virsungius's* new Vessel.

9. That he had seen *Lacteal Vessels* upon the *Mesocolon* coming from the Intestines; which is certainly true. *I have seen them myself.*

10. That the external *Hæmorrhoidal Veins* did not arise from the *Vena Cava*, but were Branches of the *Vena Portarum*. That their extreme

treme

extreme Branches perforated the Skin itself, and ended in little Tubercles under the Scarf-Skin; and to these were applied *Leeches*. The *Hæmorrhoidal Vein* rises sometimes from the *Splenick Branch*, sometimes from the *Mesenterick*, but most frequently at the very Division of the *Vena Portarum*. This Vein scatters it's Branches all over the *Mesocolon*.

The *Mesocolon* differs from the *Mesentery* in Thinness.

Three or four Branches of Arteries pretty large rising from the *Cæliac*, enter the *Spleen*.

There are several Branches of the *Splenick Vein*, distributed through the whole Substance of the *Spleen*, contrary to the Opinion of *Sylvius*, who asserts that their Mouths only open into the *Spleen*, but they do not at all penetrate it's Substance.

Obs. When any one dies of a lingering Disease, the *Spleen* is black; if he dies violently, it is red.

The *New Vessel* of the *Pancreas*, and the *Porus Cholidochus*, perforate the *Duodenum* at the same Place; sometimes it enters the Intestine by different Foramina, as it happens in Dogs.

He shewed us a Plexus of Nerves in the *Mesentery*; for what Use?

The *Porus Cholidochus* appeared to me to be very large in this Body.

The *Left Kidney* in this, and in all other human Bodies, is larger and higher situated than the right, and removed at a greater Distance from the Trunk of the *Vena Cava*, whence the *Emulgent Vessels* are likewise longer on that Side. He certainly gave a very probable Reason for this, because the *Liver*, by lying upon the right *Kidney*, both depresses it, and at the same time hinders it's Growth.

In the right Side, this Body had two *Emulgent Arteries*; the one entering the Sinus of the *Kidney* at the usual Place, and the other at it's upper Extremity.

The *Ureters* in this Woman were very large, which he affirms to be common to all Woman, because they are of a moister Habit, and void a greater Quantity of Urine.

The right *Glandula Renalis* receives a Vein from the Trunk of the *Vena Cava*, but the left from the *Emulgent*. These Glands have a Cavity within. The right one lay upon the Body of the *Kidney*.

The two *Spermatick Arteries* arise near one another from the Trunk of the *Aorta* below the *Emulgents*. The left *Spermatick Vein* rises from the *Emulgent* of the same Side, but the other has a double Origin, viz. one from the *Emulgent*, and the other from the Trunk of the *Vena Cava*, and these two soon are united into one.

He affirms that he has seen *Lacteal Veins* in pregnant Woman scattered upon the *Uterus*; which he conjectures very probably convey that watery Serum in which the Child swims, to the Cavity of the *Womb*. I have found these *Lacteal Veins* very easily in an *Ewe with Young*.

The *Mesentery* rising from the three uppermost *Vertebræ* of the *Loins*.

He shewed the *Seminal Vessels*, which descend indeed to the *Ovaria* but do not enter their Substance, but running over the broad *Ligaments*

to the convex side of the *Ovarium*, are spent partly upon the *Tubes* of the *Uterus*, and partly distributed to the *Womb* itself.

The *Tubes* of the *Uterus*, placed at each Angle of it's *Fundus*, answer to the *Horns* of the *Uterus* in Brutes, and are hollow all along, so that you can push a Probe from the *Uterus* to the further Extremities of them. Their internal Coat is white, and there is frequently found in them a white serous Humour, which is looked upon to be the *Female Seed*.

The *Ovaria*, or *Female Testicles*, have no *Epididymis*; they are connected at one Extremity by nervous Ligaments to the *Uterus*, and their Substance is more soft and lax than that of the Male. One of them in this Woman being ulcerated had a Cavity.

That the *Testicles* neither in Males nor Females conduce nothing towards Generation, he proved by a very remarkable Experiment. He cut off the *Testicles* of a *Dog* leaving the *Epididymis* of each entire, then he shut up a *Bitch* in a Room for three Years, and admitted no *Dog* to go in to her when she was hot, except the one he had castrated, who lined her several Times. In the space of three Years she littered three Times, at one Time she had seven Puppies, at another Nine, and at a third Five. After having made this Experiment, he let the *Bitch* go. He gave us two or three Instances more of Cases parallel to this; one of a *Horse* he had castrated, leaving only one *Epididymis*, who impregnated several *Mares*, and was extremely salacious; another of a *Dog* which his Servant cut in the same Manner; and a third of a Countryman, who by *Venereal Buboes* had lost both his *Testicles*, the *Epididymis* of one of them only remaining, yet he married a Wife afterwards, and had three Sons by her. He believes therefore that the *Testicles* serve no other Purpose than that which *Aristotle* assigns, viz. *As Weights to hinder the Spermatick Vessels from intangling with one another*. And indeed the Seminal Vessels do not terminate in them, nor pass through them, but only the *Epididymides*.

The Cavity of the *Uterus* is very strait and small, but it's Coat is thicker and firmer than I could have imagined.

The *Round Ligaments* of the *Womb* have no Perforation into the *Uterus*, but answer in some Measure to the *Vasa Deferentia* in Males.

The *Internal Orifice* of the *Uterus* is shut up with a thick viscid Liquor in time of Pregnancy, as I have frequently observed in *Cows*, so that nothing can pass that Way into the *Uterus*: Whence no *Semen* can be thrown at that Time into the *Womb*, and thereby a *Superfætation* is prevented. He told us however a Story that he had heard of a Woman who lived in the neighbouring Mountains, who three Months after she had born one Child, bore another at the full Time.

The Mouth of the *Womb* resembles much the Mouth of the *Tench Fish*, and it's Body is shaped like a Barber's Pot.

The *Vagina* is large and wrinkled within, but in Whores who have been long used to frequent *Venery*, these Wrinkles are abolished, and it becomes quite smooth.

N. B. In this *Vagina* there were a great many Vessels, (*viz.* Veins and Arteries) arising from the Internal *Iliacs* or *Hypogastricks*, interwoven into *Plexuses* and anastomosing with one another, that are spread upon it's Surface, and probably with their little Mouths, or Capillary Extremities, open into it's Cavity, and pour into it the Menstrual Blood; although *Marchetti* asserts, that he could never find out the Orifices of these Vessels; and indeed no Wonder. Some of these Branches are likewise spread upon the Neck of the *Womb*.

In the *Pudendum* he shewed us the *Labia*, and the *Clitoris*, in the upper Angle of the Chink. The *Wings* or *Nymphæ* in it's upper Part, the *Urethra*, or *Meatus Urinarius*, and the Membranous Circle which distinguishes the *Pudendum* from the *Vagina Uteri*, and which in Virgins is shut up by a Membrane called the *Hymen*, except a Foramen in the Middle through which the *Menstrua* flow.

In such as have been deflowered too this Circle appears, making the *Pudendum* higher in that Part; but behind at the *Vagina* is more lax and large.

The Direction of the *Vagina* is lower than the internal Orifice of the *Womb*, whence if the *Penis* happens to be too long, it will throw the *Semen* beyond that Orifice into this *Sinus*, whereby the Woman will not be impregnated.

He says that he has observed even in pregnant Women the *Uterus* almost two Inches thick.

Obs. 1. The Reason why young Women are cured by Coition of that Disease which with us is called *The Green Sickness*, is because the *Penis* distends pretty much the *Vagina*, and by it's Friction unlocks the Orifices of the Veins, and thereby brings down the *Menstrua* upon them.

2. The Place where Surgeons ought to cut Women that are troubled with the Stone is in the upper Part of the *Vulva* near the *Labia*, by thrusting a Director into the *Urethra*, and cutting upon it through the fleshy Neck of the Bladder.

3. The *Urachus* in Man (not in a *Fœtus* while it is yet contained in it's Mother's Belly) is not perforated according to *Marchetti*, but serves by way of a Ligament to assist in suspending the *Bladder*.

4. He never found a *Stone* sticking in the middle of the *Ureter*, but always either near the *Pelvis* of the *Kidney*, or else near the *Bladder*.

The 16th of December.] He shewed us the *Muscles* of the *Thorax* and first those called the *Pectoral*, which serve to draw the Arm towards the Breast; their Insertion the same as in *Veslingius*. Then the *Musculi Serrati antici minores*, serving to bring the Shoulder forwards, and placed under the *Pectorals*, are inserted into the *Coracoid Process* of the *Scapula* on each Side.

Then the *Musculi Serrati antici majores*, which serves to draw the *Scapula* forwards and downwards, and are inserted into the Basis of the *Shoulder Blade*.

Next

Next the *External Intercostals*, which arising from the lower Edge of the Rib above, are inserted into the upper Edge of the Rib below; and then the *Internal Intercostals*, which arising from the upper Edge of the Rib below, are inserted into the lower Edge of the Rib above. The Fibres of these Muscles intersect one another obliquely in the form of a St *Andrew's Cross*: *Viz.* the Fibres of neither of them run perpendicular to the Ribs, but obliquely.

We observed the *Mammary Veins* and *Arteries*; the *External*, which arise from the *Axillaries*, and the *Internal*, which arise from the *Subclavians*, and having proceeded some way within the Cavity of the *Thorax*, are divided into two Branches, one of which perforates the Muscles of the *Thorax*, and is bestowed upon the *Breasts*; while the other running downwards as far as the middle of the *Rectus Muscle*, is joined by *Anastomoses* with the Extremities of the *Epigastrick Vein*.

He told us, that he had observed the different *Capillary Branches* of this Vein terminating in so many different Tubes of the *Breasts*; and further, that he imagined the *Milk* was not produced from the *Chyle*, but from the *Blood*.

The *Subclavian Muscles*, arising from the *Clavicles*, where they are joined with the *Acromion*, are inserted into the first Ribs, where they are connected to the *Sternum*.

We observed the Muscles called the *Sphincter* and *Levatores Ani*, which all have their Origin from the lower Part of the *Os Sacrum*, where it is joined to the *Os Coccygis*.

In *Ulcers* and *Fistul* of the *Anus*, Surgeons ought to take Care, that they do not cut the Fibres of the *Sphincter* across, because thereby the Power of retaining the Excrements will be lost.

The *Cephalick Vein* divides and distinguishes the *Pectoral Muscles*, from those called *Deltoid*.

In the *Neck* we observed, first the *Platysma Myoides* fleshy, *viz.* the fleshy Membrane abovementioned in this Part, degenerated into a Muscle, which being fixed to the Chin, bends the Head downwards.

Then the *Mastoid Muscles*, as they are called: As also the *Digastricks*, which perforate the *Stylo-hyoïdæi*, with their middle Tendon.

He shewed the Muscles of the *Os Hyoïdes*, of which there are six Pair.
1. The *Sterno-hyoïdæi*. 2. The *Coraco-hyoïdæi*. 3. The *Stylo-cerato-hyoïdæi*. 4. The *Thyreohyoïdæi*. 5 and 6. The *Genio-hyoïdæi*, external and internal.

He next dissected the *Uvula* with it's Muscles, of which there are two Pair, *viz.* the *Pterigo-Staphylini* external and internal.

He shewed the Muscles of the *Scutiform Cartilage*, of which there are three Pair. 1. The *Sterno-Thyroidæi*. 2. The *Crico-Thyroidæi*. 3. The *Hyo-Thyroidæi*.

The Muscles of the *Arytenoid Cartilage*, of which there are four Pair.
1. The *Thyreohyoïdæi*. 2. The *Arytenoidæi* or *Sphincter*. 3. The lateral *Crico-Arytenoidæi*. 4. The posterior *Crico-Arytenoidæi*.

The

The Muscles of the *Pharynx*, of which there are three Pair. 1. The *Stylo pharingei*. 2. The *Spheno pharingei*. 3. The *Cephalo pharingei*, which are rather the fleshy Beginning of the *Œsophagus*, than Muscles; also the Muscle called *Œsophageus*, which shuts up the *Pharynx*.

1. In the *Bastard Quinsey*, the Tonsils are inflamed, and in the *true* one the Muscles of the *Larynx*, but especially the *Arytænoidei*.

2. In the *true Quinsey* his Father made an Incision into the *Larynx*, between it's two uppermost Rings, and introduced a Silver Pipe into the Wound, by which the Patient respired, and so cured it. But the Surgeon ought after having made an Incision, to divide a little, and turn aside as dextrously as he can, the *Sterno hyoidei* and *Sterno thyroidei* Muscles.

3. He told us that he had observed a Branch of the *Ductus Thoracicus* or *Chyliferus* going to the Pericardium, and introducing a Pipe into it, he inflated this Bag, whence he rationally conjectures that the Lymph is thereby derived into the *Pericardium*.

4. The Human Lungs viewed externally are pretty much in the Shape of an *Ox's Hoof*.

5. The Branches of the *Windpipe*, or *Bronchia* within the *Lungs*, have no annular Cartilages.

6. The *Valves* of the *Vena Cava*, are called *tricuspides*; those of the *Pulmonary Vein*, *Mitrales*; because, taken together, they represent somewhat a Bishop's Mitre; the *Valves* of the *Pulmonary Artery* are called *Sigmoid*, and these of the *Aorta* the *Semilunar*.

The *Pericardium* in this Body was preternaturally connected at it's Point to the *Diaphragm*.

We observed a *double Gland* below the *Larynx*, under the *Sterno thyroidei* Muscles, upon each Side of the *Aspera Arteria*, which in the *Bronchocele* (to which the *Inhabitants of the Alps and the high Mountains* are subject) swell to a great Bulk.

He observed likewise the *Thoracick Duct* send one little Branch to the *Parotid Gland*.

The 18th of December,] He dissected the Muscles of the Back, viz. 1. The *Trapezius*, or *Cucularis*, so called from it's Figure, of which *Veslingius* has treated at large. The *Rhomboides*, which terminates in the Basis of the *Scapula*. 3. The *Levator Scapulæ*, called the Muscle of *Patience*, or the poor Man's Muscle, because poor People, when they are denied an Alms shrug up their Shoulders, saying, *We must have Patience*. 4. The *Latissimus Dorsi*, which is inserted near the Top of the *Shoulder-Bone*, and from it's Office is also called the *Scalptor Ani*. 5. The *Lesser posterior Serrati*, which are the highest. 6. The *greater posterior Serrati*, which are the lowest. 7. The *Longissimus Dorsi*, which runs the whole Length of the Back, united at it's Beginning with the *Sacro-Lumbalis*, and gives off two Slips, or nervous Tendons, to each of the *Ribs*, which decussate one another in the Form of a Cross, viz. the external Slips run upwards, and the internal ones downwards. 8.

The *Sacro-lumbalis*, which, being joined with the preceding Muscle internally at it's Beginning, is connected to the *spinal Processes* of the *Vertebra* as far as those of the *Neck*, giving off likewise Slips to each of the *Ribs*, but the external ones are fleshy, and not tendinous, like those of the last. 6. The Muscles called *Semispinati*.

He shewed us besides, the Muscles of the Head and Neck; and first the *Splenius*, from it's Resemblance to a *Bullock's Spleen*. It is inserted into the Occiput, and (which is not observed by *Veslingius*, or other Authors) it sends a pretty strong Tendon, detached from the rest of the Muscles to the transverse Process of the second Vertebra of the Neck. 2. The *Complexus*, so called because it seems to be composed of different Muscles. 3. The *Rectus Major*, or external. 4. The *Rectus Minor*, or internal, arising from the Tubercle of the first Vertebra. 5. The *Obliquus superior*. 6. The *Obliquus inferior*. 7. The *Musculus mastoideus*. 8. The *Longus*. 9. The *Scalenus*. 10. The *Transversalis*. 11. The *Spinati*, concerning which you must consult the Anatomical Authors. Then the *Musculus sacer* and *Quadratus Lumborum*.

He next gave us a View of the Muscles of the Face. Upon the Fore-head the fleshy Membrane degenerates into a Muscle, beginning to grow double at that Part where the Hair ceases to grow.

Obs. 1. These Muscles which move or draw the Lips from one another obliquely, called *Sardonii*, ought to be cut in that Disease, which is called the *Risus sardonius*.

2. If the Head is rubbed with the Fat which grows upon the Cranium, it will produce Plenty of Hair.

3. People who die of a malignant Fever, have the Intestines after Death livid, or of a greenish blue Colour.

4. The *Pericranium* is not different from the *Periosteum*, only the *Periosteum* in the Head is called *Pericranium*, and may be divided into several Layers, v. g. seven, or even ten.

5. The *Temporal Muscles* are covered with a proper Membrane, both for their Defence, and to keep them in their Situation, which some have falsely taken for the *Pericranium*. We must take Care not to wound this Membrane; because a Wound in it frequently occasions Convulsions, and hence Wounds here are esteem'd mortal.

The 19th of December.] He dissected the Muscles of the Face: of the *Nose* two, viz. the triangular and oblique: Of the *Eye*, the *Sphincter* of the *Eyelids*: Of the Lips, the *Elevators*, viz. of the *upper Lip*, of which there are two Pair; one rising from the inner Angle of the *Eye* common to the Lips and Nose. The Muscles which rise from the *Os Jugale*, and therefore called *Zygomatichi*, ought to be dissected in the *Risus sardonius*. He observed that these Muscles were wanting in some Subjects. The *Constrictor*, or *Sphincter* Muscle of the Lips, is by some called the *Musculus basiatorius*. The *Depressors* of the under Lip, arising from the Lower Part of the Chin, are very spongy on that Part where the Hairs grow. There is another Pair which likewise draws

draws the lower Lip downwards, inserted into the Angles of the *Sphincter*, or of the Mouth.

The Muscles of the *lower Jaw*, viz. the *Temporal*, *Masseter*, external and internal *Pterigoidai*, all which pull the lower Jaw upwards; then the *Digastricks* which depress it.

Note 1. In trepanning the Skull, we ought to avoid the Sutures: for if the *Dura Mater* (which is join'd with the Pericranium at the Sutures) is hurt, there is great Danger of the Patient's dying convuls'd.

2. The human Brain is very large, compared with the Bulk of the rest of the Body.

3. I have observ'd in the *Ventricles* of the Brain, two Bodies called *Hippocampi*, or *Sea-Horses* and *Silk-Worms* by *Arontius*, from their Likeness.

4. The *Brain* does not pulsate of itself, but only from the Arteries: For if you open the Skull of a living Animal, and lay open the Brain, and on one Part of it remove the *Pia Mater* with the Vessels running upon it, you will see that Part where the Membrane still remains pulsate, and the other Parts where it is taken off free of any Pulsation. He asserts, that he has made this Experiment, and that the Brain after the Cranium was remov'd, pulsated more than a Quarter of an Hour.

5. We observ'd the *fourth Pair* of Nerves, or *Fallopian's*, which arising from the posterior Part of the Brain, and creeping by the Sides of it's Basis, go out near the third Pair.

6. We observed several of the first *seven Pair* of Nerves not to be simple, though they went out at one Foramen, but really divided, and composed of several others, viz. the third and fifth Pair consisted each of four Nerves, the sixth of eight or ten; but all these taken together are not so large as I would have imagined.

7. The *Glandula Pituitaria* is larger and firmer in Man, than I have usually observ'd it to be in Brutes.

8. Under the Membrane of the *Infundibulum*, he shewed us two little white Bodies of the Bigness of a Vetch, and of the Figure of the Testicles, which, he says, his Brother first discovered. *But they are painted by Vellingius.*

9. In the great Cavities of the Nose, I observ'd four Bodies or more, oblong, spongy, and covered with a Membrane, which probably keep the Mucus from running out.

10. The *Pia Mater* seems composed of the Coats of Veins and Arteries, which are very numerous upon it.

He next dissected the *Eye*, and shewed us six Muscles belonging to it.

1. The *Elevator*, call'd likewise the *Superbus*, and *Spanish Muscle*.
2. The *Depressors*, *humble* and *Capuchins*. 3. The *Adductors*, *Drunkards* and *German Muscles*. 4. The *Abductors*, or *whorish Muscles*. 5. The *Oblique*. 6. The *Trochlearis*, or *Pulley-Muscle*, called also the *Lover's Muscle*.

The anterior Part only of the Coat of the Crystalline Humour is called the *Aranea* or *Cobweb-coat*, the posterior Part is call'd *Hyaloidis* or *vitrous*.

He observ'd Nerves going into each of the Muscles; I mean those of the *Eye*.

The *Vesiculæ Seminales* are placed like Wings on each Side of the *Vasa Deferentia* immediately above the *Prostate Glands*, and have their Origin or Root near these Glands.

These are nothing else than the *Vasa Deferentia* dilated immediately above the *Prostata*.

Whores in Coition have the Art of tightening the *Vagina* by protruding the *Os Occygis* inwards, and thereby increasing the Pleasure of Copulation.

The 21st of December.] We observed on one Side the *spermatick Artery*, after rising pretty low down from the Trunk of the *Great Aorta*, ascend upwards, and climb over the *Emulgent* of that Side.

We saw plainly an Orifice from the *Capsula Seminalis* into the *Urethra*, as also into the *Seminal Vesicles*, so that a Probe could be easily introduced into each of them. That Foramen which terminates in the *Urethra*, has a Valve, by means of a Tubercle in the Neck of the Bladder, or a small Caruncle in the Beginning of the *Urethra*, which hinders the *Semen* from oozing out involuntarily, or from regurgitating into the *Capsule*.

He asserts that he never found *Semen* in the *Prostate Glands*, nor any Foramen by which it could pass from thence into the *Urethra*. *But I am of another Opinion, and imagine Semen to be contain'd in these Glands, even in Men.* He thinks therefore, that these Glands were only made to compress the Neck of the *Bladder*, and thereby conduce to throw out the *Semen* with sufficient Force.

Towards the Top of the *Urethra*, viz. near the Extremity of the *Glands*, the Canal dilates itself, and forms a little Sinus, in which if there stagnates any acrid or putrid Matter, whether it is seminal, or Urine, it occasions sharp Pains, and produces little Pustules.

A yellow *Gonorrhœa* occasions very violent Pain.

He dissected the *Muscles* of the *Hand*, which are these. 1. The *Deltoid*. 2. The *Coracoid*, serving to raise up the Arm. 3. The *Rotundus major*. 4. The *Rotundus minor*, which depresses the Arm. 5. The *Infra-spinatus*. 6. *Supra-spinatus*. 7. The *Infra-scapularis*. These serve to rotate the Arm at the Shoulder. 8. The *Biceps* chiefly remarkable on Account of it's double Origin; one of it's Heads passing in a Sinus or Groove in the Head of the *Os Humeri*, like the String of a Bow at the Nut, and inserted by it's Tendon into the Head of the *Scapula*. 9. The *Brachæus*, which bends the Arm. 10. The *long Muscle*. 11. The *short one*, which unites with the other. 12. The *Anconæus*. These extend the *Cubit*. 13. The *Quadratus*. 14. The *Teres*. These are called *Pronators*. 15. The *Supinator longus*. 16. The *Supinator brevis*. 17. The *Palmaris*, which is extended over the whole *Palm* of the *Hand*. 18. The *external Flexor of the Carpus*. 19. The *internal Flexor of the Carpus*. 20. The *external Extensor of the Carpus*. 21. The *internal Extensor of the Carpus*. 22. The *Flexors of the first Joint of the Fingers*, called *Lumbricales*, arising fleshy from the Tendons of

of the *Flexors* of the second Joint of the Fingers. 23. The *Flexors* of the second Joint called *Perforati*. 24. The *Flexors* of the third Joint, called *Perforantes*. 25. The *Abductor* of the *little Finger*. 26. Of the *Ring-Finger*. 27. Of the *Middle Finger*. 28. Of the *Fore-Finger*, the *Indicator*, the most remarkable of all. 29. The *Adductor* of the *Fore-Finger*. 30. Of the *Middle Finger*. 31. Of the *Ring Finger*. 32. Of the *little Finger*. These Muscles are placed between the Fingers in the Form of a Cross, and are called *Interossei*. 33. The *Flexor* of the first Joint of the Thumb. 34. The *Flexor* of the second Joint of the Thumb, which may be divided into four distinct Muscles. 35. The *Adductor* of the *Thumb*. 36. The *Abductor* of the *Thumb*. 37. The *Flexor* of the third Joint of the *Thumb*. 38. The first *Extensor* of the *Thumb*. 39. The second *Extensor* of the *Thumb*. 40. The *Extensors* of the Fingers, which as it were surround the Joints.

The 25th of December.] We saw the Operation of cutting a Child out of the Womb, performed in a Carcass by *Marretti* the younger: This is called *Partus Cæsarius*.

The Operation of cutting a Child out of the Womb.

He told us, that he himself had taken a Child out of the Mother's Womb, after she was dead, which lived two or three Days.

The *Incision* is to be made on one Side, taking Care to avoid the *Linea alba* and the Parts near it, upon Account of the Tendons of the Muscles, which meet all about that Part, and when they are divided very difficultly unite again: and on that Side too where you find the Child's Head to be situated.

In making the *Incision* you ought to be very cautious, cutting gradually and gently, for fear of wounding the *Intestines*. As soon as the Surgeon has got fairly through the Muscles and *Peritonæum*, he ought to thrust in two of his Fingers, and keep these Parts up while he enlarges the *Incision*. In the same manner when he opens the Womb, he ought to be very careful not to wound the Child.

As soon as the Woman is delivered, the Wound must be sew'd up with a Needle passed through all the Muscles and Membranes; and the Threads ought to be hid at every Stitch. But the Womb itself is by no Means to be sewed.

Having done this, you ought to inject into the Womb a Decoction of *Sanicle*, *Confrey*, and other *Vulneraries*; as also the roughest Wine you can get. But first of all, you must apply to the external Wound of the Belly, Linnen Cloths moistened with the White of Eggs, and afterwards Plasters, as *Diapalma*, &c. But if the Wound comes to a Suppuration, you must put in a Tent at the lower Part of it,

He told us that he could never observe the *Ossa Pubis* separate in the Time of Labour; for he had laid his Hand upon that Part in the Time of the most difficult Births, but could not be sensible of the least Disjunction, or Oblongation of these Bones. He quoted an Argument taken from *Hippocrates* against the Opinion, taken from a *Callus*, which

which is commonly found on Bones that have been dislocated, or broke, and hinders the Separation of them for the future.

*A Dissection of
a Hare.*

The 1st of January.] In a Hare dissected, we observ'd the *Intestinum Rectum* of a very great Length, having large *Pilulæ* of Dung *secundum intervalla*. I call here the Gut (so far as it had no *Cellulæ*) *Rectum*, tho' indeed it had one or two Convolution.

The *Intestinum Cæcum* was of a vast Bigness and Length: In Bigness it far exceeded the *Colon*, and was full of Excrement. Just at the Entrance into it out of the *Ilium* was another *Appendix* of a globular Figure; the *Tunicæ* of it more fleshy, and fuller of Veins and Arteries than the adjoining *Cæcum*; there was also a little round Hole in it. The *Cæcum* towards the farther End of it was small, round, fleshy, full of Vessels, red-colour'd like the *Jejunum* in a Man; the inner *Tunica* granulated, and this for more than 4 Inches in Length.

The *Spleen* was small and long, thicker at one End; it had no *Vesicula Fellea*, that I could find. (*In another we found the Vesicula Fellea manifestly*) The Kidneys large, and the Left situate higher than the Right. The *Glandulæ Renales* receiv'd not their Vessels from the *Emulgents*, but from great Veins on each Side going to the Loins.

The *Stomach* was full of Grass (as I conjectur'd) which smelt like the Wax of an Honey-comb when the Honey is newly drained from it.

It was a Female, and had long *Cornua Uteri*, but did not *gestare* when we cut it up.

It seem'd to have such a Cavity under the Tail, above the *Foramen Ani*, as I have observ'd in a *Badger*.

I believe now, that the Matter contain'd in the *Stomach* was *Fir* chew'd small, the which the Smell argu'd.

*A Dissection of
a Mountain-
Hen.*

The 2d of January.] In a *Mountain Hen* I observed two *Appendices cæci* more than half an Ell long. At their Beginning where they rise from the *Rectum*, after three or four Inches they are reflected or convoluted, but in this first Convolution there is no Excrement contained; then they both creep upwards by the Side of the Intestines, and are very large and full of Excrement. At their Orifice, where they are joined on to the *Rectum*, they have an annular Kind of Muscle, or a Sort of *Sphincter*.

The *Liver* was large, and divided chiefly into two Lobes. I could not find any *Gall-Bladder*, but two large *Pori biliari* opening into the *Duodenum* by two distinct Orifices not far from one another.

The *Spleen* was small, and triangular. The *Stomach* somewhat muscular, having it's internal Coat in some Parts of an horny Hardness. The *Heart* was very large.

In the *Stomach* and *Crop* were the Tops and Buds of the Leaves of the *Fir-Tree*, which being opened sent out a resinous pleasant enough Smell, very like that of the Stuff contained in the *Stomach* of the Hare.

II. A Girl 16 Years old, a Daughter of Mrs *Elizabeth Worth* of *Plymouth*, about the End of *April* 1709, had a few hot Pimples rose on her Cheeks, which Bleeding, and a Purge or two, cur'd. She continu'd very well 'till about a Month afterwards, when her Face, so far as is usually cover'd with a Vizard-Mask, suddenly turn'd black like that of a *Negro*. This surprizing Accident much frighten'd her, especially after some foolish People perswaded her she was bewitch'd, and never to be cur'd: By Prayers, Exorcisms, &c. which they used, in order to relieve the Fascination, they increas'd the Passion and Terror of Mind to a great Degree, even to Distraction, and then desir'd my Assistance.

Of an unusual Blackness in the Face. By Mr J. Yonge, n. 323. p. 425.

By the Arguments which I used, and some composing anti-hysterical Remedies, the Violence of her Fits became much pacify'd. I directed a Lotion for her Face, which took off the Discoloration; yet it return'd frequently, but with no Regularity, sometimes twice or thrice in 24 Hours, sometimes five or six times. It appears insensibly, without Pain, Sicknes, or any Symptoms of it's Approach, except a little warm Flushing just before it appears. It easily comes away, and leaves the Skin clear and white, but smuts the Cloth that wipes it from the Face; it feels unctuous, and seems like Grease and Soot, or Blacking mix'd: It has no Taste at all.

She never had the *Menses*; is thin, but healthful: The Blackness appears no-where but in the prominent Part of her Face. There are a thousand Eye-Witnesses to the Truth of this uncommon Case.

The anomalar Blackness of the Girl's Face is now [*Nov. 1.*] divided into a few dark cloudy Specks; which appear but seldom, and nothing so livid as formerly. *Ibid. p. 432.*

III. Having frequently observ'd that the poor Women, when their Children are troubled with the *Itch*, do with the Point of a Pin pull out of the scabby Skin little Bladders of Water, and crack them like Fleas upon their Nails; and that the Slaves in the *Bagnio* at *Leghorn* do often practise this mutual Kindness one to another, it came into my Mind to examine what these Bladders might be. *The Itch caused by Animalcules. By Dr Bonomo. Communicated by Dr R. Mead. n. 283. p. 1296.*

Finding an *Itchy* Person, I enquir'd of him where he felt the greatest and most acute *Itching*; he pointed to a great many little *Pustules*, not yet scabb'd over, of which picking out one with a very fine Needle, and squeezing from it a thin Water, I took out a very small *Globule* scarcely discernible: Observing this with a Microscope, I found it to be a very minute living Creature, in Shape resembling a *Tortoise*, of a whitish Colour, a little dark upon the Back, with some thin and long Hairs, of nimble Motion, with six Feet, a sharp Head, with two little Horns at the End of the Snout, as in *Fig. 127, 128.*

Fig. 127, 128.

I repeated the Search frequently in several *Itchy* Persons of different Age, Complexion, and Sex, and at different Seasons of the Year, and in all found the same Animals, and that in most of the watery *Pustules*; for now and then, in some few, I could not see any.

And

And though, by reason of their Minuteness, and Colour the same with the Skin, 'tis hard to discern these Creatures upon the Surface of the Body, nevertheless I have sometimes seen them upon the Joints of the Fingers in the little Furrows of the *Cuticula*, where, with their sharp Head, they first begin to enter; and by this gnawing and working in with their Body, they cause a most troublesome *Itching*, 'till they are got quite under the *Cuticula*; and then 'tis easy to see how they make Ways from Place to Place by their biting and eating, one single one happening sometimes to make several *Pustules*, of which I have often found two or three together, and for the most Part very near to one another.

With great Earnestness I examined whether or no these *Animalcules* laid Eggs; and after many Enquiries, while I was drawing the Figure of one of them by a Microscope, from the hinder Part I saw drop a very small, and scarcely visible, white Egg, almost transparent, and oblong, like to the Seed of a Pine-apple, *Fig. 129, 130.*

I oftentimes found these Eggs afterwards, from which no doubt these Creatures are generated, as all others are, that is, from a Male and Female, tho' I have not yet been able, by any Difference of Figure to distinguish the Sex of these Animals.

From this Discovery I conclude the *Itch* to be nothing else, but the continual biting of these *Animalcules* in the Skin, by means of which some Portion of the *Serum* ouzing out thro' the small Apertures of the *Cutis*, little watery Bladders are made, within which the Insects continuing to gnaw, the infected are forced to scratch, and by scratching increase the Mischief, breaking not only the little *Pustules*, but the Skin too, and some little Blood Vessels; and so making Scabs, crusty Sores, and such like filthy Symptoms.

From hence we come to understand how the *Itch* proves to be a Distemper so very catching; since these Creatures by simple Contact can easily pass from one Body to another, their Motion being wonderfully swift; and they as well crawling upon the Surface of the Body as under the *Cuticula*, being very apt to stick to every thing that touches them, and a very few of them being once lodged, they multiply apace by the Eggs which they lay.

Neither is it any Wonder if this Infection be propagated by the means of Sheets, Towels, Handkerchiefs, Gloves, &c. used by *Itchy* Persons; it being easy enough for some of these Creepers to be lodged in such Things as those; and indeed I have observed, that they will live out of the Body 2 or 3 Days.

Nor shall we be at a Loss to know the Reason of the Cure of it by Lixivial Washes, Baths, and Ointments made up of Salts, Sulphurs, Vitriols, Mercuries, simple, præcipitate or sublimate, and such sort of corrosive and penetrating Medicines. These being infallibly powerful to kill the Vermin lodged in the Cavities of the Skin; which scratching will never do, partly by reason of their Hardness, and partly because they are so minute as scarcely to be found by the Nails.

Neither

Neither do inward Medicines perform any real Service in this Case, it being always necessary after a tedious Use of these to have Recourse to those external ones already mentioned. And if in Practice we oftentimes experience, that this Disease, when we think it is quite cured by Unction, does nevertheless in a short time return again, this is not strange; since tho' the Ointment may have kill'd all the living Creatures, yet it may not probably have destroy'd all their Eggs, laid as it were in the Nests of the Skin, from which they may afterwards breed again, and renew the Distemper. And upon this Account it is very advisable after the Cure is perform'd, still to continue the Anointing for a Day or two more; which it is the easier to do, because these Liniments may be made agreeable enough, and of a good Smell, as particularly is that compounded of the Ointment of *Orange Flowers* or *Roses*, and a small Quantity of *Red Præcipitate*.

IV. *Accounts of Books omitted.*

1. *Bibliographiæ Anatomicæ Specimen*, five Catalogus omnium pene Auctorum qui ab *Hippocrate* ad *Harveium* Rem Anatomicam ex professo vel obiter scriptis illustrarunt, Cura et Studio *Jacobi Douglas*, M. D. Reg. Soc. S. & in Coll. Chirurg. Lond. Prælect. Anatom. 8vo, Londini 1715. n. 343. p. 263.
2. *Hippocratis Aphorismi* cum Commentariolo, Auctore *Martino Lister* è Medicis serenissimæ Majestatis Reginae *Annæ*, Londini 1703. n. 284. p. 1373.
3. *Sanctorii Sanctorii de Statica Medicina*. Aphorismorum Sectiones septem cum Commentario *Martini Lister*, 8vo, Londini 1701. n. 270. p. 83z.

CHAP. III.

The HEAD.

I. UPON reading a new Opinion started by *Baglivi* (in his *Specimen* consisting of four Books *de Fibra Motrice*) concerning the Pulsatory Motion of the *Dura Mater*, which is evident to the Eye in Wounds of the Brain, or upon laying it open in living Animals, I thought it my Business, without regarding those Arguments which agree with his Hypothesis (which perhaps are still true, although this Membrane should borrow it's Motion somewhere else, I mean not have it of itself) to examine again carefully what I had said upon this Affair.

An Experiment to discover the Cause of the Motion of the Dura Mater. by Dr H. Ridley. n. 287. p. 1480.

Let us see then, besides what he advances in several other Parts of his Book, what this famous Author says, p. 20. where are these Words: Upon seeing which Boy, I immediately began to suspect, that those strong

and regular Motions of the Dura Mater, are not owing to the Arteries which are scattered upon it, but to it's own proper Texture, which vies even with that of the Heart itself; as a little before he had called it the Heart of the Brain. Afterwards, p. 29. he has the following, *Wherefore the Cause of the Pulsation of the Dura Mater, is in the whole Membrane, and in it's proper Substance, nor is it to be looked for any where else.*

Allow me now to quote what follows from my own Book, cap. 6. *A great many of the Ancients, and also some of the Moderns, especially Willis and Vieussens, finding a Pulsation in these Sinuses, after the Manner of the Arteries, attributed it to the Arteries which terminate in them. But being a little doubtful of the Truth of this Assertion, to put an End to the Controversy, I tried the following Experiment. Having tied a Dog and fixed him properly, I took away a sufficient Portion of the Skull, but we could not observe the least Pulsation neither of the Dura Mater, nor of the Longitudinal Sinus; but after a little while, from the above Sinus, which was accidentally opened by Means of an hot Iron, which was designed for another Purpose, a violent Efflux of Blood following, after the Vessels were considerably emptied, the Blood began to flow out by Jerks, with a very observable Pulsation both of the Sinus and of the whole Membrane. I laid open the Sinus (though in vain) it's whole Length, to try if I could find out, by the spurting Stream of the Blood, the Insertion of some of the Arteries, several of which both Vieussens and Wepfer said they had seen inserted into it.*

This seems sufficient to demonstrate, contrary to the Opinion of Bourdon, that there is no other Motion in these Sinuses, except that which is communicated both to them and the Dura Mater, by the Arteries which are dispersed through the whole Substance of the Brain, (assisted, as I imagine, by the Concurrence of those which are distributed to the Membrane itself) as Fallopius, Volch. Coiter, and others formerly asserted.

To make the Thing still more evident, I tried the following Experiment:

I trepann'd the upper Part of the *Parietal* Bone of a Dog, and laid bare the *Dura Mater*, not without some Loss of Blood. The Hæmorrhage being immediately stopped with Lint, and the Blood wiped clean off, there appeared a pulsatory Motion of that Membrane, and of the longitudinal Sinus, which ran by the Border of the *Foramen* made by the Trepan, exactly resembling the Vibrations of the Heart, which were quicker than usual, and quite corresponding with it in the Number of Vibrations.

Some Persons who were along with me viewed this Vibration for a Quarter of an Hour; after which I tried to lay hold of the Membrane with a Hook, that so by raising it up, and elevating it with a Knife, I might examine sufficiently the Motion of the Brain below. Having made the Perforation (which the Dog seemed to feel very sensibly, but without any Sort of Convulsion) there followed an Hæmorrhage as before, which was likewise very soon stopp'd.

The

The Blood being washed away, at that particular *Foramen* made by the Puncture of the Hook in the Membrane, appeared the pulsatory Motion of the Brain, pushing outwards a small Clot of Blood that stuck in it.

Afterwards introducing the blunt Point of a Pair of Forceps into the Opening of the wounded Membrane, I cut it across in that Part which was most remote from the *Sinus*, upon which the Brain covered with the *Pia Mater* protruded itself through the Aperture, the Motion still continuing pretty strong to the Touch, although the Membrane itself, upon Account of the Elasticity of it's Fibres being diminished by the Wound, appeared to vibrate more obscurely to the Sight.

All this while the Dog continued strong, only he had *Tremors*, with a Kind of Horror all over his Body.

After some Hours taken up in observing these Appearances, during which the Dog was tortured with various Symptoms, and had lost a great deal of Blood, at last, to take away all the pulsatory Force, which can be supposed either in itself, or supplied somewhere else upon Account of it's Fibres; (of which I have given a faithful Description in the first Chapter of the Book above quoted, and by means of which it increases that Motion first communicated by the Brain) I rubbed gently upon it a few Drops of the *Oil of Vitriol*, whereby it was tinged of a black Colour. Hence there was no Vibration to be perceived, or at least very little; but notwithstanding it being thus rendered unfit to yield to the Impulse of the Brain, yet upon touching it with the Finger you could feel the Pulsation of the Brain distinctly enough.

After all this, the Dog continuing still in Spirits, upon introducing the Point of a Knife about an Inch into the Brain, he struggled very hard, and was taken with violent Convulsions both of his Body and Limbs; at which Time having put my Finger as formerly into the above Aperture, I could feel the Brain move stronger than before. Afterwards I pushed a Spatula deeper into the Brain, which occasioned Symptoms of the most violent Pain. At last, upon pushing the Instrument to the opposite Side of the *Cranium*, the Animal was thrown into terrible Convulsions; and now, that all Doubt concerning the Motion of the Brain might be removed, both I and the By-standers, pushing our Fingers in as before, could feel it's *Systole* and *Diastole* acting with great Force. Now I cannot see what can be desired more towards discovering the true and genuine First Cause of this Motion, provided the *Phænomena* which occur in this Experiment be carefully attended to.

But that I may not seem deficient in other Authorities, out of a great many Observations, I shall subjoin the following instead of all the rest, as you will find it in the *Misc. Curios. German.* Decur. 2. An. 4. of the Year 1685, Obs. 129. by *Theod. Moeren*; which runs thus:

This great Contusion had broke both the Dura and Pia Mater, had confounded the very Substance of the Brain, and the Blood had made it's Way

A Fracture of the Skull.

into the glandular Cavities of the Brain, which I wiped off gently with a Probe armed with soft Silk; and having cleansed the Wound, after applying proper Medicines both externally and internally, I bound up the Head.

But I was surprized at it every Day: For by the continual Pulsation of the Brain, there was protruded a fungous Substance, which I was obliged to dress twice a Day, and though I had a very proper Pair of Scissars for cutting it off, yet I could not help sometimes occasioning an Hæmorrhage, which obliged me to put my Probe as far down as the Canthus of the Eye, in order to clear the Blood from the Cavities of the Brain, which otherwise by stagnating would have produced more grievous Symptoms.

I saw a Case formerly very like this, and it was dressed every Day for a long while by a very able Surgeon.

As to the Office assigned to this Membrane by *Baglivi*, viz. that by compressing more closely the *Cortex* of the Brain, the animal Spirits are produced in greater Plenty, and distributed to the more remote nervous Parts of the Body.

In the first Place I would observe, what a vast Number of Branches the *Carotid Arteries*, when they arrive at the Brain, distribute through all it's Substance both Cortical and Medullary; so that according to *Malpighius*, they bear the Proportion of one Third to all the other Arteries in the whole Body; which Assertion I found not much stretch'd beyond the Truth, upon comparing them with the other Arteries, after having filled them all with Wax.

Secondly, the inverted Situation of the *Cortex* of the *Medulla Spinalis* (where we must likewise necessarily allow a constant Secretion and Distribution of the animal Spirits) being placed on the Inside, and the Medullary Part where the Nerves escape without. The Application is very plain.

A Bone taken
from the Falx,
&c. by Mr.
Cheselden.
n. 337. p. 281.
Fig. 131.

II. Fig. 131, shews a Bone taken from the *Falx*, or first Process of the *Lura Mater*, of a Man who died of violent Head-Aches.

The Optic
Nerve wasted,
by the same, ib.
Fig. 132.

III. Fig. 132, shews the *Optick Nerves*; the Right Nerve being wasted and discoloured: both the Eyes appear'd to be very good. I had not an Opportunity of enquiring into the Case of this Person; but I suppose it must have been a *Gutta Serena*.

Of a Remark-
able Fracture
of the Skull,
by Mr C. A-
mijand,
n. 317. p. 173.

IV. We had last Campaign a Soldier in the Hospital at *Ghent*, who had receiv'd a remarkable Fracture of the *Skull*; it was in the interior Part of the *Squamosæ* Bone, and occasion'd by a Splinter of a Fellow-Soldier's Piece bursting, that struck him there. Some Time had pass'd, before the Accidents made us suspect a Fracture, and oblig'd us to make a triangular Incision upon the *Temporal* Muscle; a Fissure was discover'd, which indicated the Necessity of the *Trepan*. It was apply'd twice, the first not making Room sufficient to extract a large Piece

Piece of the internal Table, very much depress'd. After this, all the Accidents disappear'd; but twelve Days after the Operation, Rigors, cold Sweats, an intermitting Pulse, and some other Signs of an approaching Death, made us despair of his Recovery. He died the 15th Day from the Operation, and the 20th from his Wound. His Skull was open'd, and in it 3 very remarkable Fissures were observ'd: The first had, notwithstanding the *Sagittal* Suture, cross'd from one *Parietal* Bone to the other, as far as the *Coronal* Suture on that Side opposite to the Wound; another had gone cross the *Coronal* Bone; and the third was on the *Parietal* Bone, on the Side of the Wound, pretty near the *Sutura Squamosa*; but what is most singular, is, that none of these Fissures did reach that upon which the Trepan had been apply'd. An *Empyema* was found in the *Thorax*, and a considerable *Imposthume* in the Liver.

V. At the first *Newberry* Fight, in the Time of the late Civil Wars, the Doctor was shot by the Right Eye on the *Os Petrosum*, by the Orbit of the Eye to the Skull, which was likewise broke, with great Effusion of Blood from the Wound, Mouth, and Nostrils.

An Account of a Musket Bullet coming out of the Head of Dr R. Fielding near Thirty Years after. Written by himself. n. 320. p. 317.

The Surgeon carefully probing the Wound for the Discovery of the Bullet, but failing of his Intention, on the third Day after the Shot, plac'd him horizontal to the Sun; by which Means depressing the broken Skull with the Probe, he could see the Palpitation of the Brain, but could not discover the Bullet.

When the Doctor began to grow cold, his Mouth closed up, and so continued for the Space of half a Year, till many Fractures of Bones were come out of the Wound, Mouth, and Nostrils; and afterwards, whensoever a Scale of Bone was to come out, his Mouth would close, infomuch that several Years after he prognosticated to some Friends, that a Bone was then coming out, which continued so for six or seven Weeks, at which Time finding an Itching in the Orifice of the Wound, with his Finger he felt a Bone; upon which he made known to some Friends then present, that they should see him open his Mouth, and taking out a Bone no bigger than a Pin's Head, he immediately open'd his Mouth.

At the second *Newberry* Fight it heal'd up, no Art could keep it open. After this, for the Space of ten Years, or more, a Flux of sanious Matter issued out of the Right Nostril, and then ceasing there, it flow'd from the Left Nostril for some Years: At length, for the Space of two Years, or thereabouts, upon Riding, the Doctor would sometimes find a Pain on the Left Side, about the Almonds of the Ear, which he attributed to Cold, but more especially after riding in a cold dark Night, which occasion'd a Kind of Deafness too; and having stopp'd his Ear with Wool to recover his Hearing, one Day, either Writing or Reading, suddenly an Huff came in the Ear, which made him start, and in the Manner not to be express'd, unless you can imagine

gine a *Vacuum*; this happen'd about *March* or *April* 70. Upon this all that Side of the Cheek hung loose, as tho' paralytick, and under the Ear might be felt a hard Knob.

After this, Tumour upon Tumour appear'd on that Side under the Jaw-Bone, which occasion'd his consulting some Physicians, two at one Time, one of which suspected the Bullet, which, considering the Shot, they thought not credible. At length the Tumors coming to the Throat, if he held up his Head a little, it seem'd as if one with a Hook did pull down the Jaw-Bone, and if any thing touch'd the Throat, it was as painful as if prick'd with a Handful of Needles; being at last perswaded to make some Applications, a small Hole appear'd, after that another; and a third Part near the *Pomum Adami*; by these the Bullet was discover'd, and cut out in *August* 1672.

Observations
on the Struc-
ture of the
Ear, by Dr
A. Adams.
n. 311 p. 2415.

VI. The bony Cavity of the *Ear* is covered at each End by a *Membrane*; the former is call'd the Membrane of the *Drum*, and the other is directly opposite to it; the outer is stronger than the inner. They are join'd together by the Handle of the *Malleus* adhering to the outer, and the upper Part of the *Stirrup* to the inner, which, by the Intervention of the *Incus* and the *Orbicular* Bone, make a Chain; and they seem to be acted and re-acted by these small Bones reciprocally.

Whether Artists had any Respect to this Original when they first devised *Drums*, I cannot say; but nothing can more nearly represent the Natural than the Artificial does; the Skins of this answering to the Membranes of that, the wooden Cylinder to the bony Cavity: The Sound of the Drum would be flat, without a Hole in the Side, and Nature has given a Passage from the Palate to the Ear. The Skins of the Drum would lessen the Sound, if they were not kept on the Stretch; so would those of the other flag, if the Handle of the Hammer and the Stirrup keep them not on the Tense.

This inner Membrane is closely stretch'd before the Labyrinth, the *Foramen rotundum*, and the Passage into the *Cochlea*, (I omit the *Foramen Ovale*, because the Foot of the Stirrup exactly shuts it) that so the Sound may be the bigger upon it's Approach to the Nerves. The Stirrup is generally broke in dissecting the Ear, particularly that Cover which goes over the Bone on each Side; but if it be carefully open'd, the Stirrup is intirely cover'd with a Membrane, which forms a Cavity flatly Oval, and the Inside is excavated.

Observations
on Incisions
of the Cornea,
by Dr Gan-
dolph.

n. 322. p 387.

VII. Contusions upon the Bodies of Animals do not always make the greatest Impression on the Parts that immediately receive them; an Instance of which I had in a Blow on the Eye, in *April* 1709.

There was a light Contusion on the Outside of the Part, with very little Alteration to Appearance; but a Vessel being broken within, pour'd forth a considerable Quantity of Blood: The Eye also lost it's Transparency, and almost it's Sight, which was so very weak, that it could

could scarce perceive the greatest Light when objected to it. The *Cornea* appear'd all over red, but without any Inflammation or Blood-Vessels, it receiving it's Colour from the Blood pour'd in upon the *Aqueous Humour*.

I saw the Patient the 6th Day after he had receiv'd the Hurt: He had been let Blood thrice; and the 8th Day I caus'd the *Cornea* to be open'd near the Middle; my Design being to make a large Orifice, I determin'd not to make it at the Bottom of the *Cornea*. The Orifice being made, there came forth some Drops of the *Aqueous Humour* mix'd with Blood. The *Cornea* still appear'd as red as before, and was not so even as we could have wish'd. This Circumstance made me resolve to make a second Orifice immediately, as large as the former, but lower: There run out some Drops of the *Humour*, and the Eye appear'd not so red and convex as before. The *Humour* continued coming out of the Orifice for some Time. We apply'd nothing to the Eye but a Compress, or Stupe, dipp'd in a Mixture of four Ounces of Plantain Water, and two Ounces of a Vulnerary Water.

The Day after the Operation, the upper Part of the *Cornea* was transparent, the lower Part not so red, and the whole Membrane appear'd to have recover'd it's natural Convexity. It seems that all the extravasated Blood had quite run out, had the lower Part of the *Cornea* been open'd, and remain'd so for some Time.

I observ'd the Alterations of the Eye for three Days together; in which Time the extravasated Blood seem'd sometimes to spread over the whole Cavity of the *Cornea*.

We judg'd that the Motion that the Patient himself might have used, had opened anew some Blood-Vessel, or had mix'd the extravasated Blood with the *Aqueous Humour*; for we did not perceive all that Time that there was any fresh Effusion of more Blood.

The 5th Day after the two first Incisions I caus'd a third to be made at the Bottom of the *Cornea*: There run out some Drops of the *Humour*, and continu'd so to do for some Time; and in two Days after, the Eye recover'd it's natural Transparency.

The *Pupil* was now very much dilated; but by little and little it contracted again, but not to it's usual Smallness.

The *Iris* all this while kept it's Motion, so that we cannot suspect that the Lancette, in making the Incision on the *Cornea*, any ways touch'd upon the *Iris*, because the *Pupil* continued exactly round; and a Stroke that is able to divide the Continuity of the Parts of the Eye, and cause a Suffusion of Blood, is but too capable of depriving the *Iris* of it's natural Power of contracting.

The *Pupil*, which before the Blow was one Line in Diameter when the *Iris* was contracted, is at least two Lines in Diameter at present. The Transparency of the *Humours*, and Convexity of the *Cornea*, are the same as before.

The

The Sight is now restored, and there remains no other Alteration than what necessarily follows from the like Dilatation of the *Pupil*.

From hence we may draw some Remarks, that will be of Use in Practice, and shew that Incisions may be successfully made on the *Cornea*.

1. Incisions are made on this Part without any Pain.
2. The Orifices unite again without any Scar; which has been before observed, but is known to very few.
3. We find that Plants of a discussive Quality have an ill Effect, the Patient finding himself much worse after using a Cataplasm, made of *Chervil* and *Parsley*: These Plants, which are excellent in resolving extravasated Blood in Muscular Parts, have an ill Effect when applied to the Eye, by causing Pain, and rendering the Sight more disturb'd. We had twice Experience of this; and the Patient assured us both Times, that he found himself much better from the Use of the first Medicine.

When there is a considerable Effusion of Blood in the Eye in couching of a Cataract, and no Orifice is made in the *Cornea* to let it out, it may so alter the Transparency of the *Vitreous Humour*, as to cause a Loss of Sight, which sometimes follows from this Operation.

I made the Incision higher on the *Cornea* than it ought to be, because the Person that performed the Operation, having never before made the like, and desiring to make an Orifice large enough to discharge easily the *Aqueous Humour*, I thought it proper to make it near the Middle of the *Cornea*, that the Point of the Lancette might not touch upon the *Iris*; which would have been of much worse Consequence than a Scar. The Effusion of Blood, that sometimes happens in couching of Cataracts, is discussed again, either by external Applications, or the Help of Nature; but when the Effusion is very considerable, this Operation may be necessary to prevent worse Consequences.

As for the Scar, that sometimes follows from an Incision of the *Cornea*, I remember I have read in an antient Author, that we need not fear it: but if we practise Incisions on Eyes affected with Inflammations, Ulcers, or Defluxions, which very much dilate the *Retina* and Vessels, an Escar forms itself much more easily in these Cases, and consequently we ought to use the greater Caution; which was not so necessary in my Patient, who had no kind of Inflammation on the Eye or *Cornea*.

An uncommon
Kind of Con-
vulsions; by
Dr J. Freind.
n. 270 p 799.

VIII. Last Summer, in the Year 1700, there was a frequent Rumour at *Blackthorn* in *Oxfordshire*, about some young Girls who were seized with Barkings like Dogs. This Plague infested two Families, to one of which Dr *Willis* went on Purpose, to inform himself of the Truth of an Affair so unusual, and he communicated the Case to me just as he saw it; and here I give it you in his own Words.

As

As soon as I entered *Blackthorn*, my Ears were stunn'd with a terrible Howling at a Distance, but upon going into the House where the Girls were, the Noise that they made being nearer, was quite horrible, answering one another by Turns, with a violent Motion of the Head, and a Kind of Nodding, like the Town Piper, making a very ungrateful Discord. Their Faces were not convulsed, only they had frequent gaping Motions of the Mouth, and the Pulse was like that of a Person in Health, only towards the End it became a little weaker. The Noise they made, as I thought, did not so much resemble the Barking as the Howling of Dogs, except that it was more frequent, and interrupted with Hiccups. This new canine Disease paid no Regard to the different Ages of those five Girls which I saw, but attacked them all alike, from six till fifteen. Frequently between whiles they talked very sensibly; and sometimes one of them beginning the Fray, roused all the rest, like a Pack of Hounds. At length the Spirits being quite exhausted, they were seized with a Kind of Epileptick Fit, and fell down upon a Bed that was laid on Purpose for them in the Middle of the Room, where they lay very close to one another, like Sisters, and for a little while slept very sound. Presently they were seized again with new Convulsions; they began all to beat their Breasts, and toss about their Limbs, and be troublesome to one another. Two of the youngest of them, while I staid there, awoke, shook off their morbid Sleep, and left their Sisters a-bed: But nevertheless they were taken with the same Howling with the others, and almost the same Motions of the Head.

Being struck with such an extraordinary Account, I thought it well worth the while to go and see the Thing myself; I therefore went to *Blackthorn* the 12th of June 1700, and visited the other Family labouring under the same Complaint. And here I saw one Son and three little Daughters of the same Mother, who had been ill of Convulsions upwards of ten Weeks, without any other Disease, or any sensible Cause preceding it. At first one of the Girls only was taken ill, and the first Fit held her for about two Hours. The rest, together with the Brother, as the Mother told me, were so grieved and frightened at their Sister's Complaint, that in a few Days they also were seized with Convulsions. When I went there they were all at play free from their Convulsions, and this Respite they had chearfully enjoyed more than Half an Hour, which was a great Relief to them, having wished in vain for an Interval for several Weeks before. Their Complexion was healthy enough, they spoke chearfully, were all very lively, had very good Limbs, and the free Use of them; nor did there appear any Marks of the bad Effects of this Disease, except a little Weakness and Torpor, the Pulse very good, both as to Strength and Regularity. At last the eldest Girl, about fourteen Years of Age, was taken with Convulsions as usual. She felt only one Sign of the Fit's coming on, *viz.* a Swelling, as it were, of the Stomach, which climbing gradually up to the *Fauces*, in Form of a Lump, gave Warning to the Muscles of the Head, and *Larynx* to begin their usual Convulsions. The same Symp-

tom was a certain Fore-runner of the *Paroxysm* in all of them, and if they attempted to prevent or quiet it, the Fit was thereby rendered both longer and more violent. The Sound which they incessantly and very disagreeably modulated, did not (as was reported) resemble altogether the Barking or Howling of a Dog, but rather seemed as it were a very unusual Kind of Tune composed of three Numbers, or Notes twice repeated, interrupted with a short Sigh, and closed at last with a single Note, which was a great deal stronger and more acute than the others. It is impossible for me to express to the Life this doleful Sing-Song; it is of that Kind which can only be remembered by such as have good Ears, but cannot be described. However, she sung this imperfect Song of her's almost without Intermiſſion; for sometimes she varied the Notes by Turns, and sometimes when she was out of Breath, both the Motion and Vociferation became more frequent, till at last being almost suffocated, she would stop for a Note or two, and hold still her Head a little, and by this means having recovered a little Breath, she would begin anew again her old Sing-Song. This was always accompanied with a reciprocal Nodding of the Head strait backwards and forwards, but never moving it obliquely or in a semi-circular Manner. The Muscles of the Neck were very tense and inflated; the other Parts of the Body were free of Convulsions. But when these Fits were upon her, she was scarce able to bend her Legs, neither according to her Inclination, nor as she was ordered: For during the whole *Paroxysm*, she continued quite sensible, and would either sit down or walk about as she was ordered, but had it not in her Power to utter a single Word. The Colour of her Face was no Way altered, her Eyes were fixed like those of a dead Person, but no Distortions any where except in her Mouth, which from the Contractions of the Muscles there, was just like that of a Dog. While the *Paroxysm* lasted, there was hardly any Pulse at all to be felt. She continued in these Agitations more than Half an Hour; and in this Condition, Night approaching, obliged me to leave her. Her Brother and Sisters, though they were standing by her all the while, continued free of Convulsions, contrary to Custom.

They sleep tolerably at Nights, provided they happen to be sleepy at Bed-time; if otherwise, the *Paroxysms* continue till the Morning, with as short Intervals as in the Day-time.

The Girls of the other Family were attacked with this Disease at the new Year; at which Time their Chaps were out of Order, and swelled. Soon after these which I visited were seized with Convulsions, the others were taken with Epileptick Fits, attended with the Loss of their Senses; sometimes they beat their Breasts like distracted People, and sometimes run about as if they were stung with Bees, &c. none of which Symptoms they perceived for the first three Months, but were only troubled with those which I described above.

This extraordinary Complaint of these Children put their Mother upon consulting of Quacks; from which finding no Relief, she was
firmly

firmly persuaded that it was owing to Witchcraft, and therefore would not call any Person of Skill.

But neither the Strangeness, nor the long Duration of the Symptoms, hinders this Disease I have described from being natural, seeing the Nature of these Spasms agrees with that of all other Convulsions, being owing to the animal Spirits producing Disturbances in the Nerves, and so occasioning various Contractions of the Muscles, according to what is common in every Convulsion. So that in this Case Nature does nothing uncommon, nor produces any thing more monstrous than in other Kinds of Convulsions; for she uses organick Motions as mechanically in this Case, as in the *Chorea Sancti Viti*, or in those hysterick Affections, where the Patient now laughs, now cries, and beats the Breast violently without being sensible of it. As therefore the Action of the Muscles, whether of the *Larynx* and Head, or of the Hands and Feet, is exactly the same, and they have the same Aptitude to Spasmodick Contractions, whatever may appear to be new or strange in the Complaints of these Girls, that is to be attributed not so much to the Nature of the Symptom, as to the Part which happens to be affected, and though an Instance very rarely occurs of it's being convulsed in the above Manner, yet we shall be less doubtful of the Possibility of such a Thing happening, if *Willis's* Observation has any Weight with us; viz. that in Children, who are not yet accustomed to Exercises of the Limbs, or Affections of the Heart, the Spasmodick Matter is more frequently derived into the Nerves next to these, that is, into those of the third, fifth, and sixth Pair, wherefore in them the Face and Mouth chiefly are convulsed.

The Parents in these two Families were first Cousins to one another, whether their Nearness of Blood was the Occasion, why the other Family which remained well for some Months after the first, was at last taken ill of almost the same Complaints, I leave to those who are studious of Sympathies and the Horoscope.

IX. We had, in 1702, an Epidemical Fever, attended with very surprising Symptoms; in the Beginning the Patient was frequently attack'd with the *Colica Ventriculi*; Convulsions in various Parts, sometimes violent Vomiting, and a Defentery; the Jaundice; and in many of them a Suppression of Urine; and what Urine was made, was highly saturated with Choler: About the State of the Distemper, large purple Spots appear'd, and on each Side of 'em two large Blisters, which continu'd 3 or 4 Days: these Blisters were so plac'd about the Spots, that they might in some measure be term'd Satellites or Tenders: Of these, there were in many four different Irruptions; but the most remarkable Instance I saw in this Fever, was in a poor Boy of *Lynn* in *Cheshire*, one *John Pownell*, about 13 Years of Age, who was afflicted with the following Symptoms upon the Crisis or Turn of the Fever, he was seiz'd with an *Aphonia*, and was speechless six Weeks, with the follow-

*An Account of
Strange Epileptic Fits, by
Dr C. Leigh.
n. 280. p. 1174.*

ing Convulsions; the Distemper infested the Nerves of both Arms and Legs, which produc'd the *Chorea Sancti Viti*, or *St Vitus's Dance*; the Legs sometimes were both so contracted, that no Person could reduce them to their natural Position; besides these, he had most terrible Symptoms, which began in the following manner; he could perceive the Fits to come on about the *Os Sacrum*, or Extremity of the Back-bone, and the Region of the Navel, and then the Disorder, as he imagined, united about the Top of his Head; he immediately afterwards fell into violent Convulsions in the Abdomen or lowest Cavity, with that Violence, that sometimes two or three Persons were forc'd to lie upon him, to keep him in Bed, his Body being frequently rais'd from it; after this, the Nerves of the Lungs were immediately affected, and then he barked in all the usual Notes of a Dog, sometimes Snarling, Barking, and at the last Howling like an Hound; after this the Nerves of the Mandibles were convuls'd, and then the Jaws clash'd together with that Violence, that several of his Teeth were beaten out, and then at several times there came a great Foam from his Mouth; afterwards he had an extreme wild Look, snatching at any Thing near him, and would have tore off his Flesh, had he not been prevented by the Persons about him; This made me conjecture he might formerly have been bit by a mad Dog, which had introduced the *Hydrophobia*; but I was convinc'd to the contrary, for I put a Bason of Water by him, and he was not in the least afraid of it, nor attempted to lap it. I saw him in three of these Fits; but at other times in these Convulsions, he roar'd like a Bull, made a Noise like a Hog, and sometimes like that of a Gosling; all which differing Sounds, (I take it) proceed from the different Contractions of the Lungs, variously forcing out the Air, and consequently as they were differently convuls'd, form various Sounds. In a Week's time I recovered the Boy his Speech, his Senses return'd, his Convulsions vanish'd, and the Boy is now very chearful: there have been other Persons in this Country much after the same Manner.

A Case,
wherein from
an Obstruction
of the
Left Ventricle
of the
Brain, the
Nerves on the
opposite Side
were affected;
by Dr A. A.
oams.

n. 313. p. 40.

X. Some time ago I open'd the Head of a Woman who died of an Apoplexy, and in the left Ventricle of the Brain, I found betwixt 4 and 5 Ounces of clotted Blood; and in the right Ventricle there was no Blood at all, but every Thing as usual; and all the Nerves which commanded the right Side of the Body were as strong as any I ever observ'd in a sound Animal, especially in their Origin, and, as far as I could trace them, in their Course. It was my Opinion, that, which ever Ventricle the Obstruction was in, the Nerves and Muscles corresponding to that Side were affected: but here the contrary plainly appear'd; for tho' the Obstruction was in the left Ventricle, yet the Sense and Motion of the right Side were entirely lost, and the small Remains of either were observable in the left Side.

XI. Accounts of Books omitted.

1. *Dissertatio Epistolaris de Glandulis Conglobatis Duræ Meningis* n. 328. p. 208. humanæ, indeque ortis *Lymphaticis* ad *Piam Meningem* productis. Auctore *Antonis Pacchiono*. Romæ 1705. 8vo.

2. *Consilium Ætiologicum De Casu quodam Epileptico*: Quo respon- n. 287. detur *Epistolæ Doctissimi Viri Thomæ Hobart, M. D. Annexe Disquisi-* p. 1485. tione de *Perspirationis Insensibilis Materia & Peragendæ ratione*. Auctore *Gulielmo Cole*, M. D. Coll. Med. Lond. Socio, 8vo.

3. *De Aure Humana Tractatus*; in quo integra *Auris Fabrica*, mul- n. 299. tis novis *Inventis & Iconismis illustrata describitur*; omniumque; ejus p. 1978. *Partium Usus* indignantur. Quibus interposita est *Musculorum Uvulæ*, atque *Pharyngis* nova *Descriptio & Delineatio*. Auctore *Antonio, Maria, Valsalva, Imolensi*, *Philosophiæ & Medicinæ Doctore*, in *Bononiensi* *Universitate* ad *Incisionem & Ostensionem Anatomicam* *Professore* *Conducto*, nec non *Nosocomii Incurabilium Chirurgo*. *Bononiæ*. MDCCIV. Quarto.

Dr Douglas, who gives an Account of this Book, remarks, that Mr Cowper's Account of the *Muscles* of the Ear is more accurate; and that the Author has wholly omitted the most considerable Part of Mr Cowper's *Musculus Pterigopharyngæus*, which rises from the *Processus Pterigoides*, describing only the lower Part of it, which springs from the *Tongue*, and the *Os Hyoides*, which he makes to be two Pair of distinct *Muscles*.

CHAP. IV.

The Neck, The Thorax, The Heart.

I. I lately had the Opportunity of opening a Woman, about 50 Years *A Large Tu-* old, who had a large Tumour, or hard Swelling, in the fore- *mour in the* part of her Neck, possessing all the Space between the whole Extent of *Neck, with* the lower Jaw and the upper Part of the *Sternum*, with a considerable *a Boney* Rising in it's Middle; laterally in it's Point inclining to the left Side tho' *Substance; by* the biggest Part of the Tumour was on the Right. The Skin on the *Dr J. Dou-* *Apex* of this protuberating Part was thin and shrivell'd, of a Colour *glas, n. 305.* different from the rest, and look'd as if the Swelling would have broke *p. 2214.* in that Place.

The Skin was exceeding thin, having no Fat under it, only in a Cavity between two Lobes, to be afterwards describ'd, on it's Right-side, there was a small Appearance of some; for the Skin being less stretch'd there, the Cells of the *Membrana adiposa* were not quite empty'd.

The fleshy Fibres of the *Latissimus colli* were scarce visible.

The

A large Tumour in the Neck,

The *Mastoidæus* and *Coraco-hyoides* were extremely thin, and in their Ascent they adhered very firm to the sūdjanent Tumour.

The *Sterno-hyoidæus* and the *Sterno-thyroidæus*, that run up the fore-part of this Swelling, were distended so thin, that it was difficult to separate them from it, especially the last.

The right Carotid Artery, in it's Ascent to the Head, ran along it's outer Edge, which increasing, did much obstruct the Current of the Blood that way.

The Internal *Jugular*, the *Par Vagum*, and the intercostal Pair went also over some Part of this Swelling in their Descent to the *Tborax*. Two of the Lymphatick Glands of the *Jugular* Vein were swelled to the Bigness of little Eggs, being plac'd at some Distance one from another, with a Hollow between, where some Fat was found; these two Lobes made the Tumour very uneven also on it's right Side.

These Muscles, the *Jugular*, with the two Glands adhering to it, and the rest of the forenam'd Vessels being removed on both Sides, I could easily observe the Bigness, the Figure, and the Circumscription or Limits of this preternatural Tumour, with all it's Adhesions to the adjacents Parts.

In Magnitude it seem'd to exceed that of two Fists joined together.

It's Figure was almost Triangular, with a broad Basis under the Chin sloping a little on each Side, as it descended to the upper Part of the *Sternum*, where it's Point was pretty narrow; it's Surface was made uneven, by three Risings, of which the largest was turn'd to the left Side; the other two being placed on the Right, as above remarked.

It adhered by Membranous Filaments to the *Maxillar* Glands, to the *Digastrick* Muscle, and to the *Stilobyoidæus*; under which, on the right Side, a small Portion of it, in the Form of a Nipple, did intrude itself as it were under the Tongue; in the upper and fore-part it also adhered to the *Os Hyoides*.

Laterally it was connected to the *Levator Scapulae*, and lower down to that Part of the *Cucullaris* that terminates into the *Clavicle*, backwards to all the fore-part of the *Asperia Arteria*, between it's third or fourth Cartilaginous Ring and the *Os Pectoris*, as also to that Muscle of the Head called *Rectus Internus major*, and to some part of the *Scaleni*; it's lower Part was engaged under the *Jugulum*, or lunated Part of the Breast-bone, to which it adhered.

It was easily freed from it's Connections to all these different Parts, but not so from the *Glandulae Thyroidææ* to which it adhered after a far different Manner; for where the *Thyroidal* Glands are joined to one another, a little below the *Cartilago Crycoides*, on the fore-part of the rough Artery, there was no separating of it without cutting it's Substance; whence it plainly appears, that the Union of these Glands was the Root or Beginning of this excessive Tumour: and yet, which is very remarkable, the Glands themselves kept their usual Figure, and were no larger than ordinary.

This

This Tumour was hard and very firm, being exactly of the Consistence of a Cow's Udder when boiled, yet in a few Places it was softish, containing a liquid and thick Juice.

It's Colour was chiefly of a whitish Yellow, only in some Places it was exceeding Red, from it's having a greater Store of Blood-Vessels, and in others it was very White.

Hearing the Edge of my Knife grate against something hard, while I was cutting it, I proceeded with Caution; and pared off all the soft Part, and the hard Substance that remained I boiled, and then cleared it very well, having left sticking to it at one Corner a soft Cartilaginous Body, which possibly had the Patient liv'd longer, would have acquired the same Degree of Induration. It very much resembles a Peice of white unpolish'd Rock Coral; but whether it may be reckoned osseous, or if it be rather the Viscid Humour of the Glands harden'd and concreted into this irregular Chalky or Gravelly Substance, I leave to others to determine. Fig. 133.

I remember about two Years ago, I found in the *Prostrates* of a very old Man a great many hard Bones, like white Peas, being of a Substance exactly like this, only smoother on the Outside; some of these were in the Body of these Glands, others adhered by small Roots to the Muscular Membrane that invests them. Fig. 134.

The first Appearance of this large Swelling was about twenty Years ago, caus'd by the breaking of a Vein (as the Woman used to express it) in a hard and very difficult Labour. It increased but very slowly, not arriving to any considerable Bulk 'till a few Years before she died; it was never very painful, being a true Schirrus: Many Things by several Persons had been used and applied unsuccessfully. It's Bigness at length became very troublesome, in impeding her Swallowing and free Breathing, and at last it quite choaked her, by compressing the Wind-pipe, upon which it lay.

But besides this, I observ'd another remarkable Accident, which did much hasten her End, being very painful and troublesome for a Year or two before she died.

The *Uterus* was entirely schirrous, and distended to that Degree that it filled up the whole Capacity of the *Pelvis*. Part of the *Colon* and *Ilium* adhered so firmly to it, that there could be no Separation without tearing: Both the *Ovaria* and the *Tubæ* grew close to it; and indeed the Confusion and Mixture of all these Parts was so great, that if the *Ovaries* had not been swelled here and there with Hydatidal Tumours, I could not have distinguished them.

The Neck of the Womb was pressed down so low, that upon a very gentle Dilatation of the *Labia* it offered itself to view, being extremely hard, but yet smooth and even, and so closely shut, that I could pass nothing without cutting.

It had squeez'd with the *Vesica Urinaria* so close against the *Os Pubis* that it could contain but little or no Urine, which obliged her to make it often, and with Pain. The

A Tumour on the Neck.

The Pressure of this Part backwards was so great upon the *Intestinum Rectum*, that the Evacuation of *Fæces* had been obstructed for the Space of five Weeks before she died.

There was observed to come away *per Anum* for some considerable time a great deal of *Pus* and slimy Matter, but that proceeded from the *Uterus*; for the Acrimonious Humour, which was wont to be discharged *per Vaginam*, having been pent up within it's Cavity, by the close Constriction of the *Collum Uteri*, had corroded, and eat it's way through the Substance in the Womb into the *Rectum*, by which it had it's Vent; which Case I have more than once observ'd in Dissection.

The Thickness of the Womb was near 2 Inches, and in it's Bottom there was a great deal of this Humour, white and thick, which upon touching, made the Ends of my Fingers white and rough, by shrivelling the *Cuticula*, as if I had washed them with a strong Solution of some Acrid Lixivial Salt. Thus the Caustick Salt lodged in Soap affects the Hands of those Women that wash Linnen. It was very hard to take the *Uterus* out of the *Pelvis*, by reason of it's so close Adhesion to the neighbouring Parts.

The *Fæces Alvinae*, contained in the Guts, were but few, by reason she could not swallow any thing solid for a long time, but very hard, and in several distinct Clots.

A Tumour
on the Neck
full of Hydatides,
by Mr
A. Hewnden.
n. 308 p. 2344.

II. A Gentleman in *London*, aged 25 Years, had a large Wenny Tumour, the *Basis* taking it's Origin from all the lower hinder Part of the *Skull*, stretching down the Neck near each *Jugular*, extending itself almost as low as both *Scapula's*; on the upper Part was a *Pblegmon*. The *Radix* being so large, I put on a Transverse Caustic the Length and Breadth of the Tumour, intending to separate the *Cutis* from the Membrane of the *Cystis*; but it's being so thin where the *Pblegmon* was, obliged me to divide the *Cystis*; out of which I sav'd above 60 *Hydatides*, of the Bigness of a small Walnut; several more were broke. These *Hydatides* swam in a Liquor of the Consistence of the Whites of Eggs. In this *Cystis* I found a large Quantity of *Atheromatous* and *Steatomatous* Matter, at the *Basis* a large *Sarcoma*; the greatest part I cut off, but fearing to hurt the Muscles of the Neck, deferred it to the next Dressing, intending to take the rest of the *Sarcoma*, and *Radix* of the *Cystis* away by Caustical Medicines, which I applied without Success, they coming off without making any *Escar*, the *Radix* being of a cartilaginous Substance: searching with my Probe to find some Interstice, it dropt into one; and touching some Membranous or Nervous Body, it caus'd the Patient to cry out furiously; into which Interstice I put a Peice of *Roman Vitriol*, fitted for the Place, which came out the next Day all dissolv'd, with some of the *Radix*: By the continual applying of the *Vitriol*, I extirpated the whole *Radix*, and heal'd it.

I have two things more to observe, That seven Years before this Operation, This Tumour was near as big, and subsided of itself: And that

that when I began with Caustical Medicines, the first I used was *Præcip. Rub.* with which I cover'd the whole *Radix*, which came off, and no Eschar, but it salivated the Patient for five Weeks.

III. My Father's *Cancer* took it's Rise from a small Bruise on the *Os Jugale*, and in Process of Time spread itself over the whole Cheek; and notwithstanding the Endeavours of the most eminent Surgeons in those Parts where he lived, it ulcerated his Eye round, which I saw him take out with his own hand; and afterwards extended itself to his Ear, and through his Cheek into his Mouth, and across the upper Part of his Nose, and perforated the Bone there: It likewise over-ran that Side of his Forehead, fouling the *Os Frontis*, which came away in Pieces, leaving the *Dura Mater* bare as broad as a Half-Crown; which rising through the Perforation of the *Cranium*, in a few Days putrified and exposed the Brain itself, and several Portions of it came away fresh and untainted; and that which is most strange, he perfectly retained his Senses, and rose every Day to dress the Ulcer himself, 'till a considerable Quantity of the Brain was come away; and when he was confined to his Bed, his Speech first failed, and he died about 4 Days after, his Brain being totally consumed, and nothing remaining in the *Cranium* but a small Quantity of black putrid Matter: He had neither *Spasmus* nor Convulsions of any Part all the time of his Illness. I was but young when he died, and this, to the best of my Remembrance, is the Sum of all.

An Account of a Strange Cancer, by Mr J. Kay. n. 277. p. 1069.

IV. *Alexander Palmer*, of the Parish of *Keith*, in the County of *Bamff*, in the North of *Scotland*, now about fifty-four Years of Age, observ'd, when about twenty-seven, a little hard Swelling in the Muscle of the Lower Jaw on the left Side, without any Hurt or manifest Occasion, which at first went on slowly, but afterwards it proceeded more quickly, and the older it grew, it still came on the faster; until it increased to a prodigious Bulk and Weight: From the first Appearance of this Tumour, to the total Excision of it, there were about twenty-seven Years. He had excessive Pains and Uneasiness in it, and at last it mightily extenuated and emaciated him, who was otherwise a strong and robust Man.

An extraordinary Wen cut off the Cheek, &c. Communicated by Dr T. Bower. n. 354. p. 713.

This Excrescence was of the natural Colour of the Skin, and seem'd to be an *Atheroma*, being a glandulous Substance with several big Blood-Vessels in it, and had Hair growing on it, as in other Parts of the Body, as may yet be seen. It was almost round, and very hard, and was as sensible as any other Part of the Body; for when the poor Man was working in the Fields, some six or seven Years ago, he accidentally made a great Gash or Wound in it with a sharp Iron, which was very painful, but was cured by a Surgeon, after the manner of an ordinary Wound: the Cicatrice is still to be seen in it.

This Excrescence having grown so big, was attach'd to the Muscle under the Left Eye, called *Obliquus minor* or *inferior*, to the Ear and it's Muscles, and to the Muscles of the lower Jaw, named *Deprimens*.

By reason of it's great Bulk and Weight, it could not hang down freely without some Support, therefore it rested on the Top of the Shoulder, which made a considerable Dimple in it, that is yet very observable; besides it was holden up by the Man's Hand in the Day-time, and laid on his Pillow in the Night-Season.

Some three or four Days before the total Excision was made, the Patient observed this Tumour begin to mortify at the lower End, which made him so uneasy, that he took a Knife and cut off a good Part of it. This occasioned a great Hæmorrhage: so that he reckon'd there was lost a Scots Pint, or four Pounds of Blood, before it could be stopt. The Patient, after so great Trouble and Pain, at last applied himself to Mr Gordon, Surgeon of the Place, who made a total Extirpation of it, on the 19th of *January* 1717.

He made a close Ligature, taking in the *Basis* of the Excrescence, and all the loose Skin, and contracting it as much as possible, he cut it entirely off with a sharp Razor. There gushed out of the Excrescence, after it was cut off, and was lying on the Ground, as near as could be guefs'd, two Pounds of Blood; for it was nourish'd by several large Blood-Vessels, perhaps by some Branches of the Carotid Artery much enlarged, and other Blood-Vessels coming from the Ear, and the Muscles of the Eye and lower Jaw abovementioned. When Mr Gordon brought it to us, which was full three Months after it was cut off, we cut off with a Knife about a quarter of an Inch broad of the Basis of it; and in that small Space we observed four big Blood-Vessels. The Basis, as it now appears, is five Inches Diameter, which seems too large for the whole Side of the Face: so after the Exsection, I think the loose Skin was turn'd backwards, which may make the Basis now appear so big.

After all this Blood was lost, the Excrescence was weigh'd, and was full nineteen Pound Weight; so that before his own Incision and this Operation, it ought to have been several Pounds heavier, which is a most prodigious Weight to be depending on such a Place. This Tumour was of a Spheroidical Figure, and when measured, was thirty-four Inches about by the longest Way, and twenty-eight by the broadest.

The Hæmorrhage, which was great, was stopped by the Vitriolic Powders and other Astringents, and the ordinary Dressing was used. So this great Cure was compleated in six Weeks time, and the Patient entirely recovered, and goes about his Business, to the great Astonishment of every Body. The Lid of his Left Eye continues still downwards a little, as does that same Side of the Mouth; which was occasion'd by the great Weight depending on that Side of the Face; but it may be expected they may come again to their right Posture; for the Head, at first after cutting, enclined much to the Right-side, by reason of the great Weight on the Left Cheek having been removed; but it now begins to stand upright, since he is perfectly recovered. Tho' the Skin, and even a deal of the musculous Part of the Cheek and lower Jaw, was cut away, yet Mr Gordon (from whom I had this Account) in-

forms me, that it is grown up again, and is of the ordinary Colour of the Skin, and like the other Side of the Face; so that there grows Hair on that side of the Face as well as on the other, which he ordinarily shaves, and this is as surprizing as any thing in the whole Affair.

The Excrecence is preserv'd among the Rarities of the College of Physicians at *Edinburgh*.

V. Mr *J. D.* was supposed to die of a Consumption; forasmuch as 14 Months before he had been violently seiz'd with an Inflammation of his Lungs, accompanied with a sharp Fever, Difficulty of Breathing, Cough, acute Stitches, and Pleuritick Pains, with a Spitting of Blood, &c.

A Schirrous Tumour in the Breast; by Mr T. Greenhill. n. 300.

He was bled largely in the Beginning, and often repeated it during his Sickness; continually taking such proper Remedies as were prescrib'd him: But notwithstanding, about *Easter* there appear'd a Tumour on the Breast-bone, Pap, and Pectoral Muscle of the Left Side, with a Fullness under the *Axilla*; from whence there was conjectur'd to be a Collection of purulent Matter in the Cavity of the *Thorax*, and that the *Sternum* was foul. The first from the aforesaid Tumour, and his spitting a bloody and purulent Matter, and the latter from the Rising and Inequality of that Part. But opening him the third Day after Death, I found his Case very different and surprizing, which several judicious Persons that attended him in his Sickness, and were present when he was opened, can testify. For so soon as I had divided and remov'd the common Teguments of the *Thorax*, I found instead of a rising of the Bone with Cariosity, only an oblong Tumour, about four Fingers in Length, and two in Breadth, and a proportionate Thickness, weighing 3 Ounces: It extended itself perpendicularly on the Superficies of that Part of the *Sternum* which joins with the *Cartilago Ensiformis*. I separated it with my Knife easily from the Breast-Bone, and found it to be of that Sort of Wens, or encist'd Tumours, called *Atheroma*, containing a pappy Substance like sodden Barley. Next appear'd a very large Tumour on the Left Side of the *Thorax*, covering the whole Pap and Pectoral Muscles forwards, with a Fullness under the *Axilla* of the same Arm. Then opening the *Thorax*, I found the same Tumour comprehending the Intercostals, *Deltoides*, *Subclavian*, and *Subscapulary* Muscles, and the whole Axillary and Mamillary Glands, which being obstructed, and it's Vessels replete with a creamy pappy Matter, more thick and white than the former, there was produc'd such an Induration of the aforesaid Glands and Muscles, which compose the upper Part of the Breast, that it may more properly be esteem'd a Schirrus.

p. 2009.

The same Tumour on the Outside of the Breast was somewhat bigger than one's Hand, extending itself from the Clavicle to the lower Part of the Pap; and laterally from the Basis of the Muscle quite under the Arm-pit. Internally it possess'd a third Part of the Cavity of the Breast, crouding the Left Lobe of the Lungs to the Right Side and in it's upper Part firmly growing to it; which it likewise did every

Way

A Schirrous Tumour in the Breast.

Way to the Intercostal Muscles. It was about the Bigness of a Penny-Loaf; and the whole Tumour being consider'd together, might reasonably be allow'd to weigh between 3 and 4 Pounds, which being cut into there ouzed out of it, like an expressed Sponge, a great Quantity of thick, white, and pappy Matter: And, what is more particularly remarkable, there was form'd a large Sink or *Pelvis*, in the middle of the Axillary Gland, which contain'd a thinner and discolour'd Matter, and had a free Communication to the Vessels of the Lungs in the upper Part of it, where I said before it was united; and from hence it was that he generally found Ease when he had somewhat emptied it by large Expectorations, and that he could so exactly perceive, when any thin Rheums or Matter flow'd to the Part: and as it were here only that the Lungs were black, and replete with stagnated Blood, and some Globules of the aforesaid Matter in it's *Vesiculae*. The rest of the Lungs were pretty clear from any Ulcers or Matter, but of a sublivid Colour, and strictly adhered on both Sides to the *Pleura*, but particularly on the left Side, all about the Schirrous Tumour. The *Gall-Bladder* was full of Stones, of the Bigness of a Runcival Pea, and consisted most of odd Angles, and were formed of a thick viscous Sediment of Gall (which we found in it) from an Obstruction of it's Vessels, or Jaundice, which he had some Years before: They were in Number 22, some triangular, quadrangular, quincunial, &c.

There was nothing else remarkable, except a *Marasmus* of the external Parts, and the Emptiness of all the *Viscera* and Blood Vessels in general.

A Schirrous Tumour, included in a Cystis in the Breast; by Mr R. Russell. n. 337. p. 276.

VI. *August* 18, 1713. I was sent for to Mrs *Smith*, who had been reduced very low by a Fever, which, from her Cough, sharp Pain under her Breast, and other Symptoms, was judged Pleuritick.

But upon having a Discharge from her painful Breast of a thin Gleet, all Symptoms vanished.

When I saw her first, the Liquor discharg'd by a small Pin-hole, near the *Papilla*, was little more than would have wet a Handkerchief four times double.

Examining of the Breast, I found a large Tumour, that lay deep, yeilding to my Fingers, and pasting like Dough.

I search'd the Abscess with my Probe, and twisted out with it a Matter like Sawduft, or Bran, mixed with Hair.

Upon laying open the Breast, I separated a Cystick Tumour, which weighed eight Ounces, and contain'd a solid Matter like the above-mentioned, mix'd with a Body like Hair.

Upon enquiring into the manner of it's coming, she told me, that eight and thirty Years ago, she receiv'd a Bruise in that Breast by a Fall from a Horse, which was attended with great Pain and Fluxion; insomuch that the Veins of her Breast appear'd varicous and turgid, as in a Cancer; but her Pain ceasing, they sunk, and left an indolent Tumour in her Breast, supposed by her Surgeon to be a true *Schirrus*:

Since

Since which time it hath always continued nearly in the same State, without Pain, increasing very little in Magnitude, but obstructed in such a manner that she could not nurse her Child with that Breast.

The *Tunic* was pretty thick, nourished with very small Vessels, but had form'd a *Schirrus* of the Glands it adhered to, by keeping up a Distension of Parts, 'till there was a Cohesion of their Membranes and Vessels.

I make no doubt, but this was a Body of diseased Glands, which had suffer'd a Colliquation by some extravasated Fluid, and that the Membrane of the Tumour was their proper *Tunic*.

After this manner all our tunicated Tumours seem to be form'd; for when an Obstruction proceeds to Extravasation, there is a Liquor pour'd out which consists of such Particles, that by Degrees make a Colliquation of the glandulous Flesh, which is not very sensible of Pain; and by Degrees the *Capsula* becomes distended with a Matter of a very different Consistence, which gives the Name to the Tumour, either *Steatoma*, *Atheroma*, or *Meliceris*.

Thus pour Oil of Olive on Spirit of Nitre, and your Oil first becomes a little hardened, then of the Colour and Consistence of Marrow, 'till by degrees it is hardened into a white Fat, resembling that of Animals.

The Possibility of this Colliquation and Digestion we may the easier be induced to believe, if we consider how often we find the Glands of the *Viscera* petrified, without any Degree of Pain, or the Membrane in any measure destroy'd.

VII. I took a *Polypus* out of a Child of about a Year old. It's first observable Disorders were a quick Pulse, and a Difficulty of Breathing. In about four Days the Gums were observed to be swell'd for which they were cut, and all Symptoms disappeared for five or six Hours, after which they return'd. Notwithstanding Blood-letting, and the Application of other Remedies, the Difficulty of Breathing increas'd the Pulse became still lower and quicker, and in four Days more the Child died.

The Body was open'd, and the *Viscera* of the lower Belly were found well constituted.

In the *Thorax* the *Thymus* exceeded the natural Size even in Children. The Fore-part of the Lungs appear'd to be well dispos'd, but the Back-parts were very hard, and much inflam'd. Making Incision on the diseas'd Part, purulent Matter follow'd the Knife in such quantity from divers Cells, that it filled the Wounds as fast as made, and Pieces cut from it sunk in Water. But as we approach'd nearer to the Parts unaffected, the Pieces became gradually more buoyant, till at length we came to the Fore-part, which floated.

The Cavities of the right Auricle and Ventricle of the Heart were fill'd with a *Polypus*, which was continu'd into the superior and inferior Trunk of the *Vena Cava*.

Opening the *Vena Pulmonalis* at the *Basis* of the Heart, I found it there completely fill'd with a *Polypus*, (or Coagulation of Blood) which

A Polypus in the Vena Pulmonalis: and the Structure of that Vessel; by Mr Wm. Cowper. n. 270. p. 797.

Fig. 135.
was

was continu'd into all the large Branches of it in the Lungs, and were easily drawn out.

The Structure
of the Vena
Pulmonalis.

Fig. 136, 137.

This *Polypus* affords us a better Idea of the Contrivance and Structure of the pulmonary Vein, than any Figures of that Vessel yet published: For tho' in different Subjects of the same Species, we meet with frequent Varieties in the Distribution of the Blood-Vessels, especially of the Veins; we no where find a more constant Regularity and Uniformity than in the Trunks and large Branches of the Pulmonary Vein; of which I have added two Figures, drawn after a Preparation of that Vein injected with Wax, and freed from the Lungs of an adult Human Body.

This Trunk of the Pulmonary Vein is overlook'd by *Bidloo*, unless he may be allow'd to call it the left Ventricle of the Heart, as he has done *Tab. 22. Fig. 7. A.*

Fig. 136, 137.

The Trunk of this Vein is very ill express'd in the XXXth Table of *Kerckringius's* Anatomical Observations.

The Left Auricle of the Heart (*Fig. 136, 137.*) in Human Bodies being much less than the Right, it was necessary that the Part of this Vein next the Basis of the Heart should be very large, (*ibid. AAB*) lest the sudden strong Motion of the *Systole* should cause the reflux Blood to recoil in the Branches of this Vein, (*ibid. DDEE*) and prevent a ready Supply in the succeeding *Diastole* of the Heart. But the Weight of so much Blood lying in the Trunk of this Vessel, (*ibid. AAB*) does effectually prevent it's Retrocession in the lateral Branches within the Lungs; (*ibid. DDEE*) and the more, because the Orifices of those Branches (*ibid. DD*) are not diametrically opposite (at *AA, Fig. ibid.*) to the Mouth of the Vessel on the Basis of the Heart, (*ibid. B*) it's lateral Branches making acute Angles with the Trunk, as represented *Fig. 136.*

A Dissection
of a Person
who died of an
Asthma; By
Mr W. Cooper,
n. 336. p. 534.

VIII. Mr ----- *St John* died of an Asthma at 72 Years of Age. It was remarkable, that before the Body was remov'd from the Bed whereon it lay ----- Hours after Death; that the Blister in the Neck had discharg'd not less than a Quart or three Pints of *Serum* before I began the Dissection.

In the *Abdomen* was a small Quantity of Water, such as is usual in those who die of Chronical Diseases. The Parts in this lower *Venter* were in a natural State; except

The Kidneys, of which the Right was very much contracted, even to a third Part of it's natural Size, and had two large *Hydatides*, or Bladders of clear Water, on it's Surface.

The Left Kidney was also lessen'd, but not so much as the Right: It's Surface, like that, was unequal, but had no *Hydatides* on it.

The *Ureter* of this Left Kidney was very much contorted, at it's Rise from the *Pelvis*, where it's Sides were petrified; insomuch that it's Canal was almost render'd impervious for the Passage of the Urine.

Nothing