

A

COLLECTION OF ENGRAVINGS,

DESIGNED TO FACILITATE THE

STUDY of MIDWIFERY,

EXPLAINED AND ILLUSTRATED.

BY

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L O N D O N :

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TO
AND. DUNCAN, M. D.

PROFESSOR OF MEDICINE IN THE UNIVERSITY OF
EDINBURGH, &c.

*THIS Attempt to facilitate the Study of
Midwifery, is presented as a small offering of
gratitude, by*

His Obliged, Humble Servant,

JAS. HAMILTON, JUNIOR.

EDINBURGH, }
April 20th, 1796. }

P R E F A C E.

BY the Art of Drawing, the external appearances of many objects can be so accurately represented in miniature, as to communicate a just idea of their figure and their proportions. Such are objects of a large size, distinguished by prominent features, and rendered familiar to mankind by daily observation.

But it is impossible to draw a miniature representation that can be readily recognised, of those objects which are composed of various microscopic parts united together so as to present a surface of curved lines, because the minima visibilia cannot be exhibited; since it is by these alone, and not by the proportions which the several parts bear to each other, that an idea is formed of the external

ternal

ternal characters of objects of this kind. It is this which renders it so exceedingly difficult to represent anatomical subjects on a small scale. To those whom constant habit has not made intimately acquainted with the particular parts designed to be shewn, a miniature picture of an organ of an animal body cannot convey such impressions as shall enable them to judge of the real appearance of the object thus delineated.

On this account, judicious anatomists have always chosen to make their drawings of the same size with the object they represent.

Many circumstances, however, conspire against the publication of engravings literally copied from such drawings. The expenses attending publications of that kind limit their circulation ; and hence, in the execution of these works, much time and labour are expended, without the satisfaction of contributing to public utility being reaped in return.

The truth of this observation is well illustrated in the history of Dr Hunter's plates
on

on the Gravid Uterus, and of Dr Smellie's Anatomical Tables.

Although the former of these publications be highly interesting to students of anatomy, of painting, and of engraving; a small number of copies only, and these at a reduced price too, have been sold.—And within these few years, the copperplates of Dr Smellie's work (the first publication in this island calculated to explain the mechanism of human parturition), from which no more than eighty copies had been thrown off, were actually purchased for the price of old copper.

These considerations have suggested the expediency of reducing the size of engravings relating to anatomical subjects to a scale calculated to afford the work at a small price.—These serve the purpose of recalling to the mind of the student the great outlines of the objects he formerly examined, which, without some such help, might readily escape his recollection.

To students of midwifery, drawings are as necessary as to students of anatomy; and therefore, Dr. Smellie's plates were a long time ago published in a miniature form.—

But

But within these few years, a taste for a certain degree of neatness in the execution of engravings, which Smellie's small plates do not gratify, has prevailed so much, that their sale is now almost entirely stopt.

A conviction that, without the use of plates, the phenomena of the Gravid Uterus, and the mechanism of labour, cannot be understood by students who have not the opportunity of examining frequently and carefully, the objects represented by such plates, induced the Editor to undertake the following little work.

It contains a collection of what is most essential, from the publications of Dr Hunter, Dr Smellie, and Professor Boehmer; together with two or three drawings from preparations in possession of the Editor's father——To make a complete system, some more plates are required; and these, if the present undertaking prove acceptable to the public, shall be furnished at a future period.

The plates are executed in a style of great neatness by Mr Beugo, whose merit is well known. The Editor has endeavoured to point out with care, the practical utility of each plate.

plate. That his sole object has been to facilitate the study of Midwifery, is unequivocally evinced, by the moderate price at which the work is afforded.

EDINBURGH, }
April 20th, 1796. }

Plate I.

Fig. I.

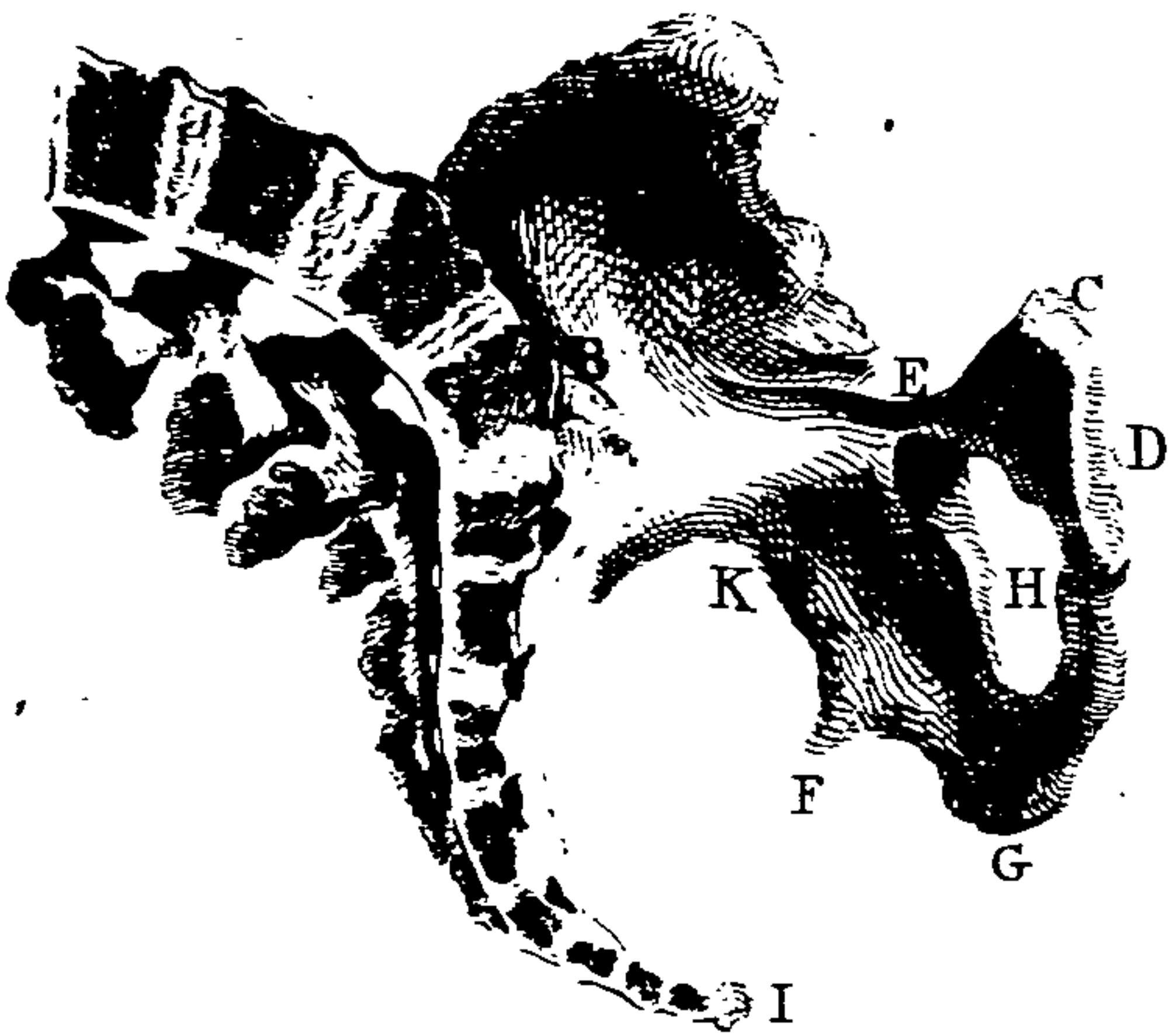


Fig. 2

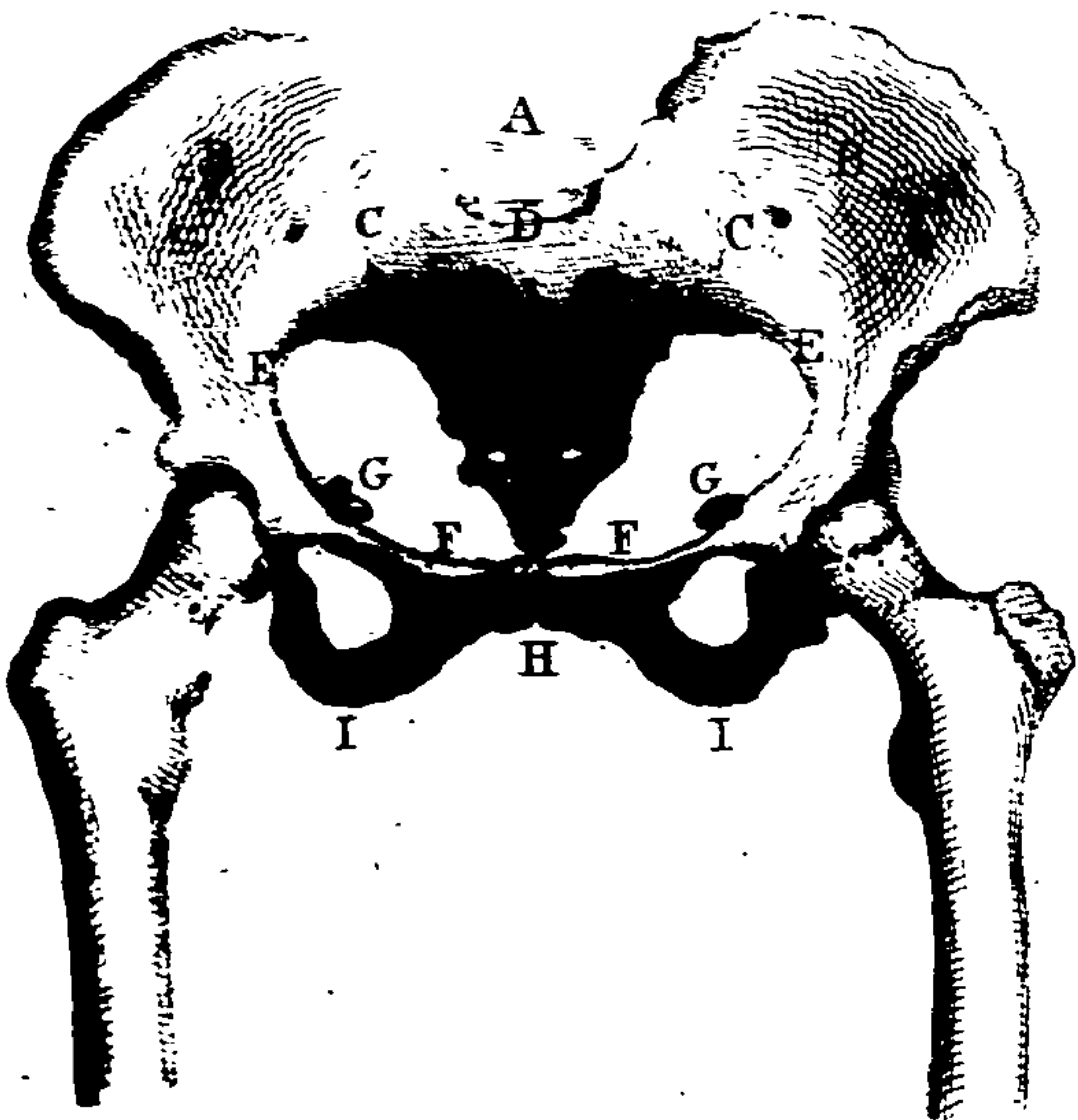


PLATE I

PELVIS OF THE SKELETON OF THE FEMALE.

FIGURE 1st, Represents a Vertical Section of the Pelvis.

A, The ilium.

B, The promontory of the sacrum.

C, The angle of the os pubis.

D, The surface by which the pubes are joined to form the symphysis pubis.

E, The body of the pubis at its junction with the ilium.

F, The spinous process of the ischium.

G, The tuberosity of the ischium.

H, The foramen thyroideum.

A

I. The

I, The point of the coccyx.

K, The sacro-sciatic notch.

THE chief purpose of this figure is to shew the depth of the cavity of the Pelvis at different parts. Thus the depth commonly is, posteriorly from B to I six inches, at the side from E to G four inches, and from the upper to the lower edge of the surface D (by which the pubes are joined), from an inch and an half to two inches.

Unless these various depths be kept in mind, a practitioner would be very much deceived in estimating the progress of the child's head through the pelvis during labour; for after it has advanced only one third within the cavity, it is at the inferior part of the pelvis anteriorly, and hence might appear just on the point of being protruded completely.

FIGURE 2*d*, Exhibits a general view of the Pelvis seen anteriorly when the skeleton is in the erect posture.

A, The last lumbar vertebra.

B B, The ilium.

C C, The sacro-iliac synchondrosis.

D, The promontory of the sacrum.

E E, The most diverging points of that part of the linea innominata which belongs to the ilium on each side.

F F, The

F F, The body of the pubes.

D E F F E, The brim of the pelvis.

G G, The spinous processes of the ischia.

H, The lower point of the symphysis pubis.

I I, The tuberosities of the ischia.

I H I, The arch of the pubes.

This figure is designed to represent the natural situation of the brim of the pelvis in the erect posture.

It lies in a slanting direction from the spine towards the horizon, for the posterior part is situated about three inches higher than the anterior.—The consequence of this is, that the line of the axis of the pelvis is different from that of the body, because a straight line produced from the lumbar column is perpendicular to the horizon. Whereas a line drawn through the centre of the pelvis, forming its axis (when extended passing through the umbilicus and the anus), is oblique towards it.

By this situation of the pelvis, the contents of the abdomen are prevented from passing through it by their own gravity.

This representation illustrates also Dr. Denman's beautiful idea, that the posterior part of the pelvis forms an arch, of which the sacrum is the key stone, and the thigh bones are the pillars, and that at the fore-part, there is a counter arch which

strengthens the former. From this and other circumstances relating both to the structure of the pelvis and to the changes induced on it by disease, it is very justly inferred, that there is no natural separation of the bones during labour.

PLATE

Fig. 1.

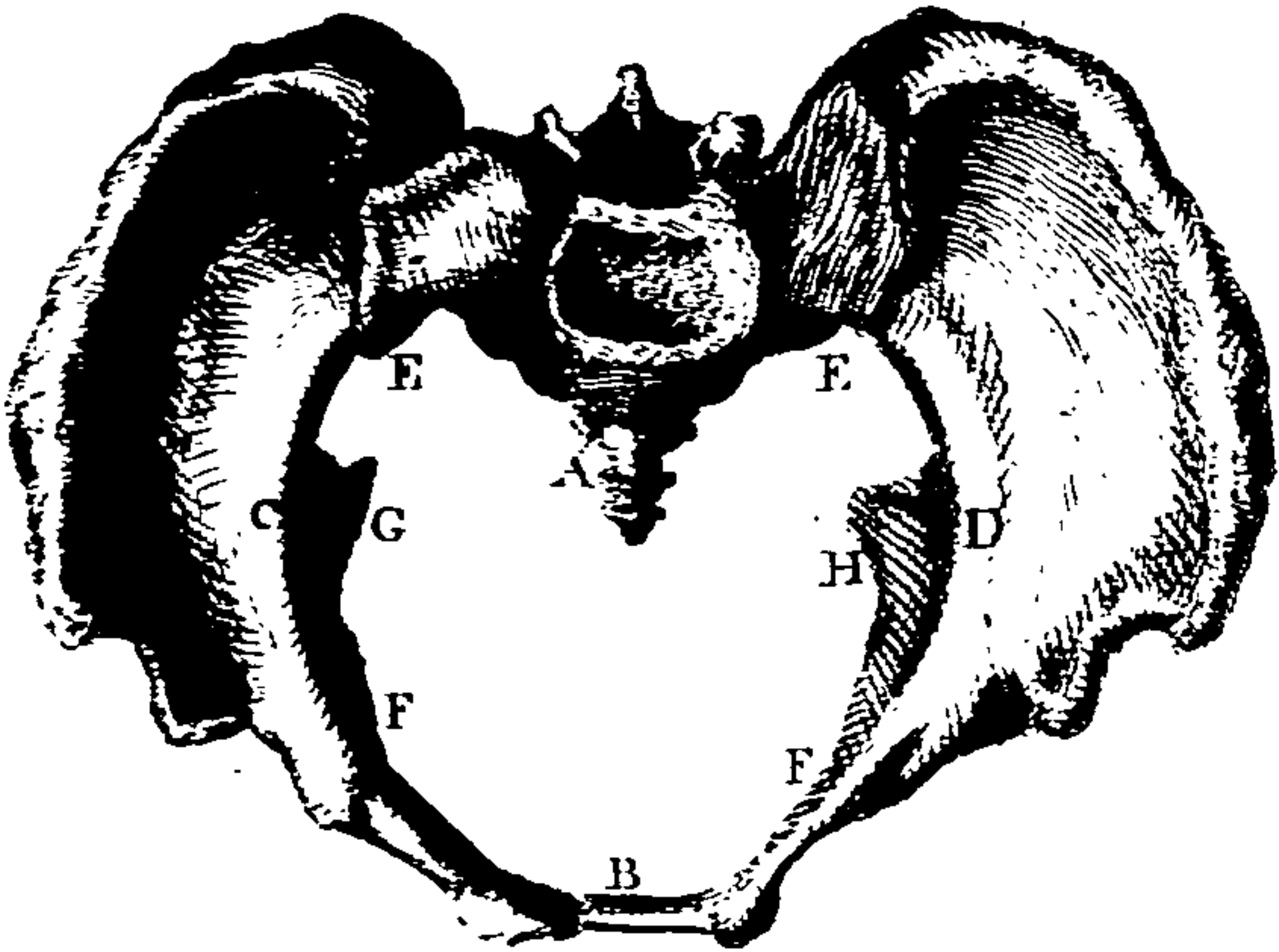


Fig. 2.



P L A T E II.

PELVIS IN THE SKELETON OF THE FEMALE, CONTINUED.

FIGURE 1/2, Exhibits a View of the Brim of the Pelvis.

A B, The short diameter measuring somewhat more than 4 inches.

C D, The longest diameter in the skeleton, measuring about 5 inches ; but as the bellies of the psoæ muscles, lodged at these points of the linea innominata, occupy on each side the space of half an inch, this is not the long diameter in the living subject.

E F E F, The diagonal, or oblique diameter in the skeleton, and the long diameter in the living subject, extending from the sacro-iliac synchondrosis on one side, to the point of the linea innominata, corresponding with the centre of the inner border of the acetabulum, on the opposite side, and measuring somewhat more than four inches and a half.

G H, Represents the diameter of the cavity of the pelvis, between the spinous processes of the ischia

ischia, and is noticed here, because its length is pretty exactly the same with that of the short diameter A B at the brim.

FIGURE 2*d*, Represents the outlet of the Pelvis.

A, Centre of the arch of the pubes.

B, Point of the coccyx.

C D, Tuberosities of the ischia.

A C B D, Are points equidistant, being distant from each other about four inches. But as in the recent subject, the pieces of which the coccyx are composed are moveable commonly until the fortieth year; the point of the coccyx (B) is capable of being made to recede about an inch; and as, where the pieces are anchylosed, the range loses one half of its length, which produces the same effect, the longest diameter at the outlet, is from the centre of the arch of the pubes to the point of the coccyx A B, which is in the same direction as the short diameter of the brim.

Fig. 1.

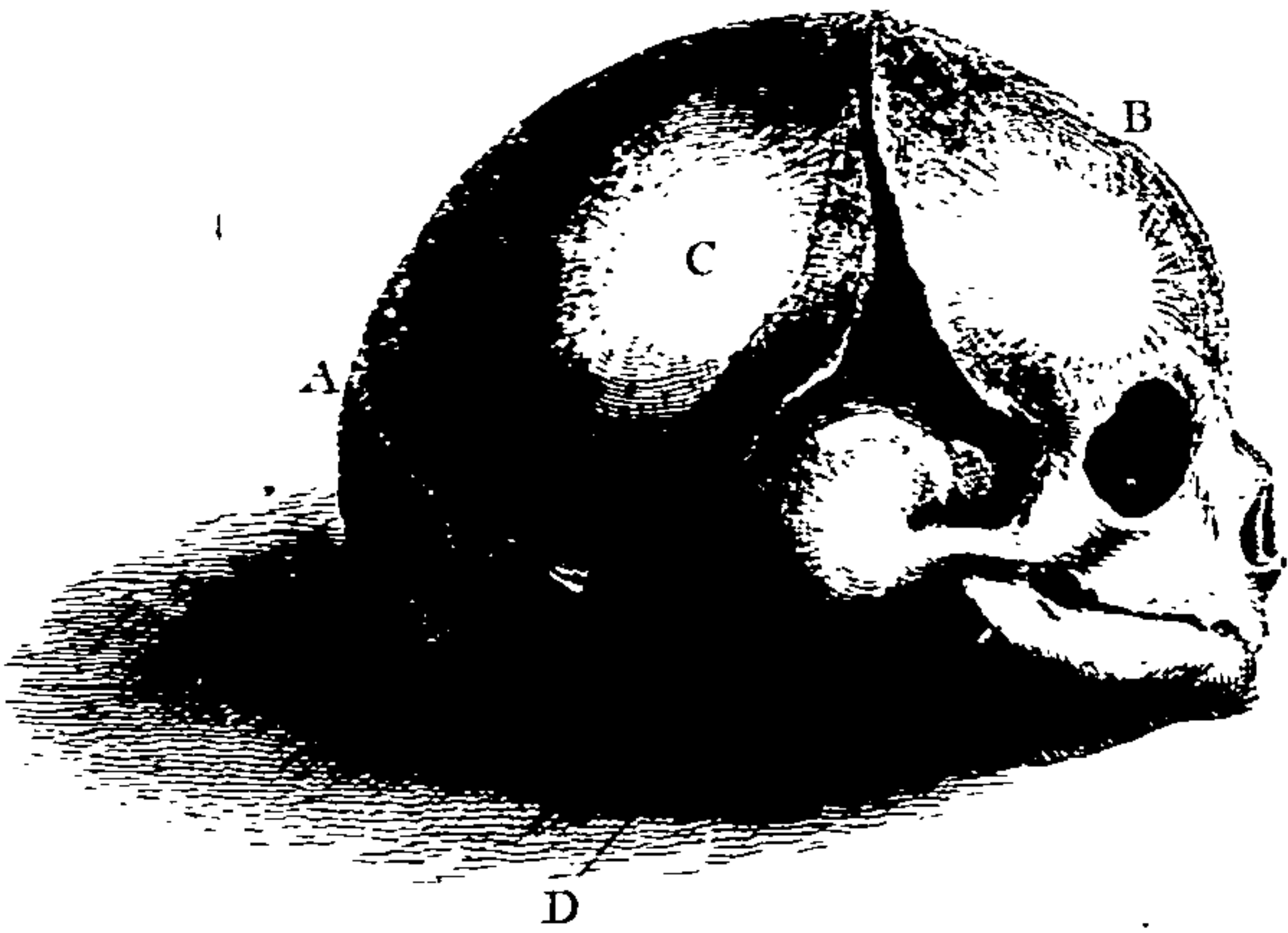
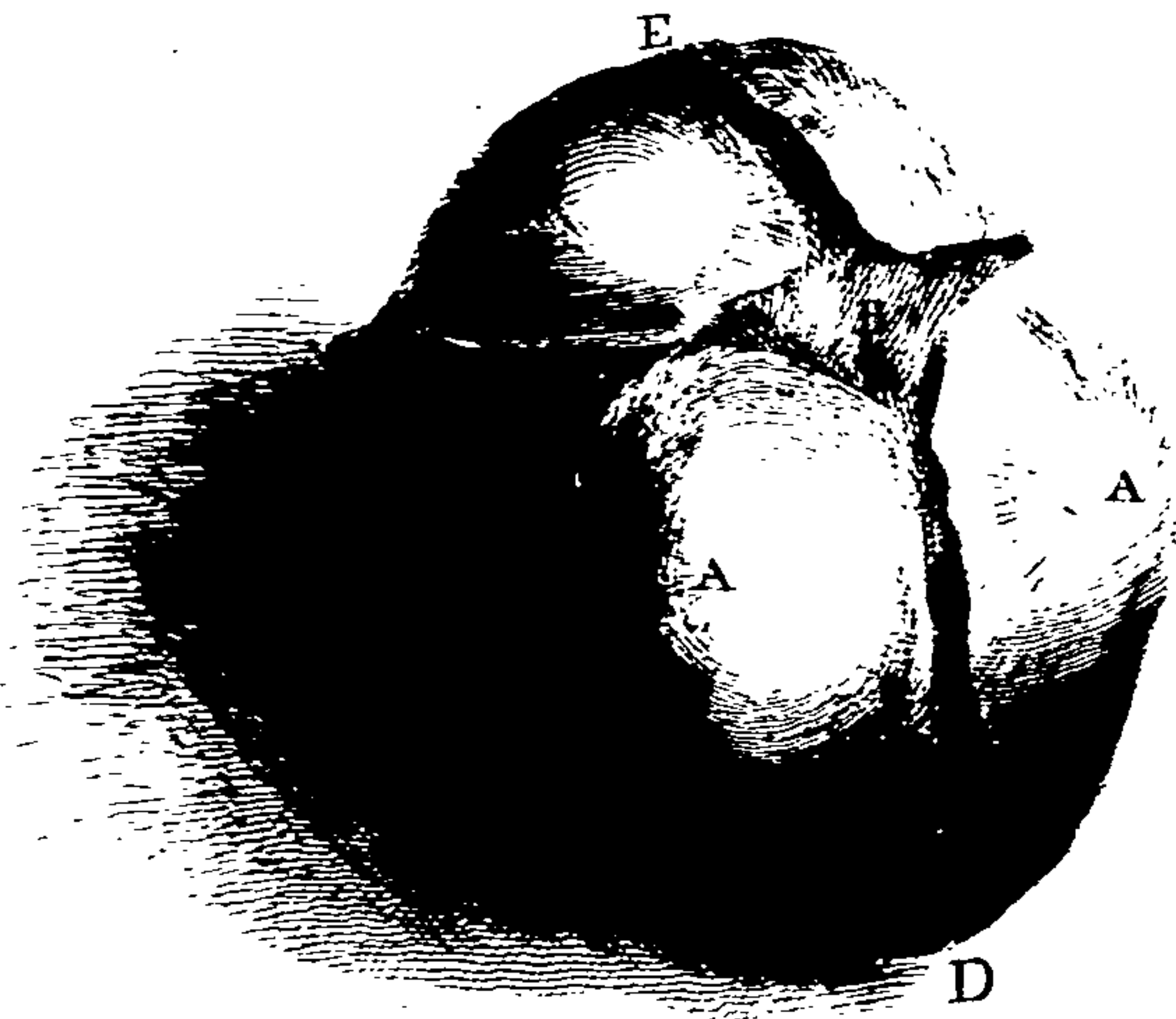


Fig. 2.



P L A T E III.

HEAD OF THE SKELETON OF A NEW-BORN CHILD
OF THE ORDINARY SIZE, AT THE FULL PERIOD
OF UTERO-GESTATION.

FIGURE 1/*β*, Exhibits the head so much inclined to one side, that a view of the base of the cranium is given.

A, The occipital bone.

B, The right frontal bone.

C, The right parietal bone.

D, The foramen magnum.

This figure is chiefly designed to communicate an idea of the general appearance of the fœtal skull. The particular position in which it is represented, was chosen in order that the situation of the foramen magnum might be seen. It is owing to the circumstance of that opening being nearer to the occiput than to the face, that the vertex is pushed foremost during the process of natural labour.

FIGURE 2*d*, Represents the head placed in such

a situation that the superior part of the cranium is seen.

A A, The protuberances of the parietal bones, distant from each other about three inches and an half, and forming the short diameter of the head.

B, The anterior fontanelle.

C, The posterior fontanelle.

E D, The long diameter of the head, viz. from the frontal to the occipital bone, measuring about four inches and an half.

This figure is intended to show the dimensions of the long and short diameter of the head, and the situation of the anterior and posterior fontanelles.

Although the distance between the parietal protuberances A A be three inches and an half, that is not to be regarded as the length of the short diameter; for in consequence of the parietal bones being connected by a membranous substance, the protuberances are capable of being made to approach each other, the edges of the bones overlapping, so as to reduce the diameter between them to three inches.

The effect of the compression of the head, is rendering the foetus insensible ; and hence, during labour it is a passive body only. It is from having overlooked this circumstance, that the strange doctrine of the foetus in utero being destitute of sensation has been advanced.

The

The breadth of the membranous substance interposed between the parietal bones, being greater than of those which connect the other bones; affords a presumption, that the head is capable of being more diminished in the direction of the short diameter than in any other; a fact, which the experiments of M. Bandeloque have fully established.

Both figures were drawn from a dried preparation, on which account, the appearance of the parietal bone, next the temporal bone in figure first, and the rugous appearance in the membranous substance connecting the several bones in figure second, are peculiarities.



P L A T E IV.

SEXUAL ORGANS OF THE FEMALE.

THIS plate exhibits a view of the uterus and appendages, and also some of the external parts. It is taken from a preparation, made by cutting out of the body, the external and internal parts. This preparation was placed before the painter in such a manner, that the posterior part of the uterus and chief appendages are represented, and the perinæum and anus being turned over upon the vagina, the clitoris, nymphæ, and meatus urinaris, are seen from behind. An opening is made at the superior part of the vagina, in order to expose the os uteri.

A, The fundus uteri, extending to each side ;
aa, the insertions of the fallopian tubes.

B, The os uteri.

C C, The fallopian tubes.

D D, The ovaria ; that on the left side being in its natural situation, and that on the right side being turned down.

E E, The broad ligaments, which support within

in their duplicature the uterus itself, fallopian tubes, ovaria, &c.

F, The perinæum.

G, The clitoris with its prepuce.

HH, The nymphæ.

I, The meatus urinarius.

KK. The fringed extremities of the fallopian tubes; that on the right side being in its natural situation, and that on the left being turned back, to show the orifice of the tube.

The natural appearance of the uterus and its appendages in the unimpregnated state, is pretty accurately represented in this plate, and the proportions of the various parts to each other are well preserved.

It might appear from this plate, that the uterus is supported *in situ*, by the broad ligaments; but this is not the case, for it is the vagina that chiefly serves that purpose.

The breadth of the perinæum was long imagined to form a criterion by which chastity could be ascertained, but this is now well known to be an error.

The situation of the meatus urinarius ought to be well known by every practitioner of midwifery. It generally lies as is represented in this plate I, about three quarters of an inch from the clitoris, in a straight line from the glans.

/ P L A T E



P L A T E V.

SEXUAL ORGANS CONTINUED.

THIS plate represents the uterus and vagina of a child about the tenth or eleventh year, slit open.

A A, The labia.

B B, The nymphæ.

C, The clitoris.

D, The meatus urinarius.

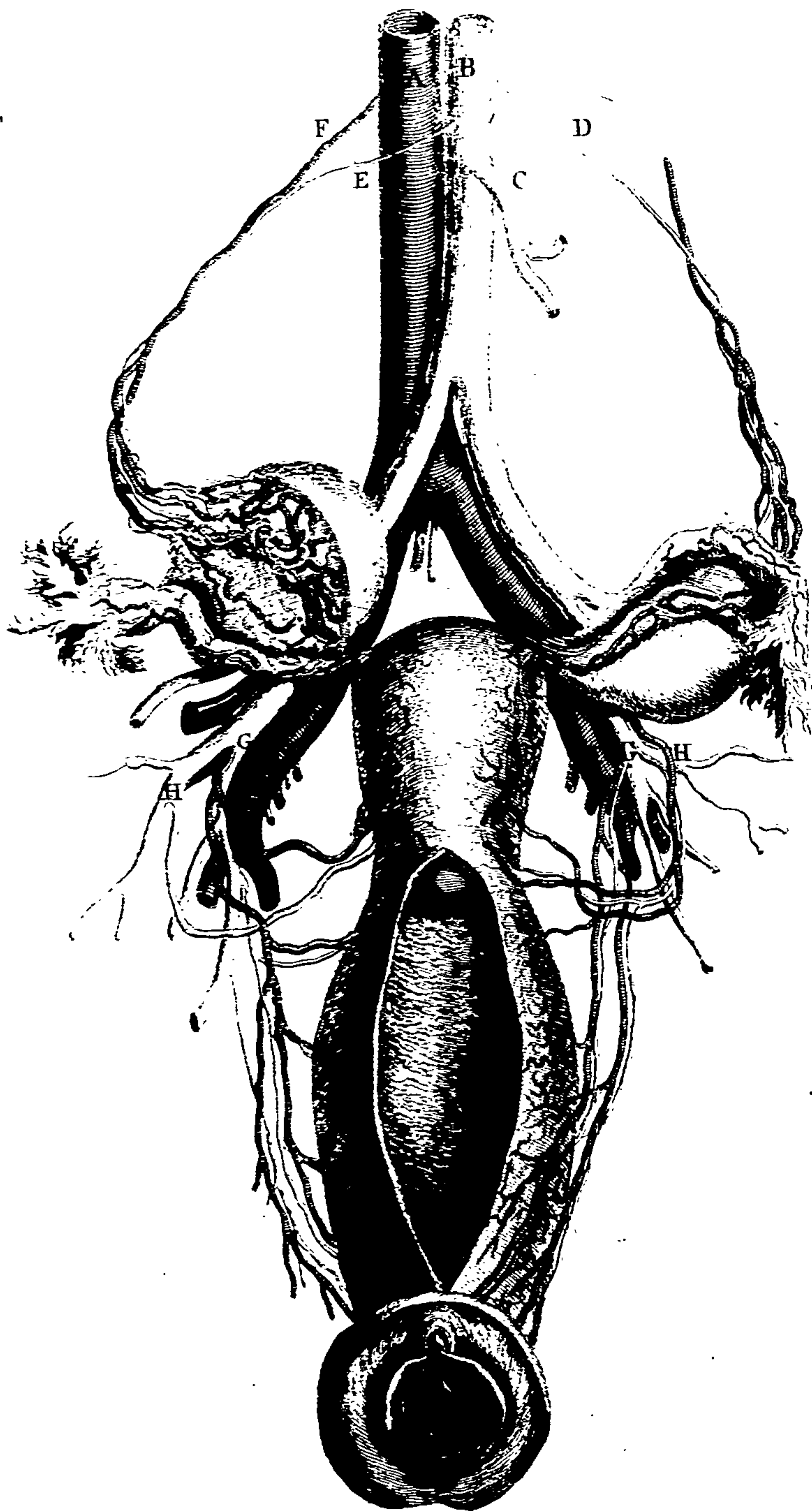
IN this plate, which it must be allowed, is more subservient to the gratification of curiosity, than to the purposes of utility, the rugæ of the vagina and of the uterus, are most beautifully represented.

Anatomists have generally imagined the carunculæ myrtiformes, to be the remains of the ruptured hymen; but they are in fact, the incipient rugæ of the vagina.

It is of some consequence to correct this error, because these first rugæ are liable to swelling, and hence, might become the subject of an surgical
cal

cal operation, were a practitioner to regard them as the useless remains of a membrane necessarily destroyed.

PLATE



P L A T E VI.

SEXUAL ORGANS CONTINUED.

THIS plate (copied from Boehmer), is designed to shew the vascular system of the sexual organs. Although not a strict representation of nature, it is sufficiently accurate for practical purposes.—The letters of reference are different from those in the original. They are also much less numerous, because it is presumed, that a particular explanation is unnecessary.

A, The vena cava.

B, The aorta cut off above the spermatics.

E D, The spermatic arteries.

C, The inferior mesenteric artery dividing into two branches, the superior of which forms the colica sinistra, and the inferior the internal hæmorrhoidal.

F, The right spermatic vein.

G G, The hypogastric arteries.

H H, The branches of the hypogastrics sent directly to the uterus.

I I, The hypogastric veins.

The

The irregular discharges of blood, which sometimes take place during pregnancy, are readily explained by this plate.

These discharges proceed from the vagina, in consequence of the branches of the hypogastric distributed through it being over-distended, a circumstance that is the natural effect of the increased determination of fluids to the uterine vessels with which those of the vagina are so intimately connected.

This accounts more rationally for those discharges, than the supposition that they are irregular appearances of the catamenia; an opinion common among women, and generally admitted even by practitioners.

The phenomena of the gravid uterus, it might be imagined sufficiently contradict this idea, seeing that the os uteri is accurately sealed up from a very short time after impregnation.—But those who have long cherished the opinion, that the menses sometimes continue during pregnancy, will not probably be convinced of their error by proofs furnished by theory alone.—They will require some more striking evidence. When the appearances of the discharges in question are accurately examined, it is found that the evacuation is either in small quantity unattended with pain, or in considerable quantity accompanied with pain in the lumbar region.—In the former case, the
marks

marks on the cloaths are not of an uniform colour, throughout their whole extent, but are of a deep red in the centre, and gradually become paler towards the circumference. In the latter, the discharge comes off in coagula or clots. In both instances, therefore, the appearances are quite different from those of the menstrual evacuation.—The periods of the recurrence, too, of these discharges are irregular; but some exceptions to this remark are occasionally observed in practice.

It may therefore be concluded, that the catamenia cannot possibly occur during pregnancy.

Blood may be discharged from the uterine vessels, as well as from those of the vagina during gestation, but such an event is always attended with symptoms threatening abortion.

Plate VII.

Fig. 1.



Fig. 2.



P L A T E VII.

EFFECTS OF IMPREGNATION.

FIGURE 1/2 represents the ovum supposed about the fifth week, prepared by cutting away a considerable part of the chorion, and turning aside the amnion, with the inclosed foetus, and considerably magnified, to shew the parts more distinctly. It is copied from figure 2d of Dr Hunter's 34th plate ; but the letters of reference are different.

A, The amnion distended with a liquor as transparent and void of colour as the clearest water through which the minute parts of the foetus were distinctly seen.

B, The foetus attached to the inside of the amnion (which at that place was contiguous to the chorion) by its belly, there being no umbilical cord.—The abdominal viscera were apparently not covered.

C, The space between the amnion and the chorion, extending to the angle at the superior letter D.—This was filled with a tender jelly, so transparent as to be almost invisible ; whence the branching arteries and veins, filled with red blood,

upon the inside of the placenta, were distinctly seen through it.

D D, The shaggy vessels of the chorion.

E, The vesicula umbilicalis distended with a fluid. It was neither attached to the amnion nor the chorion; surrounded with the tender jelly, it was connected as by a pendicle to the navel of the foetus by an artery and a vein, which lay so close together, as to appear like one vessel filled with red blood, and dispersing its branches to the vesicula umbilicalis alone.

FIGURE 2*d* represents two views of the corpus luteum, copied from Boehmer.

PLATE



P L A T E VIII.

EFFECTS OF IMPREGNATION, CONTINUED.

REPRESENTS the Ovum about the fourth month. The chorion, decidua, and placenta, are turned back, so that the foetus is seen through the amnion surrounded by the liquor amnii.

A, The amnion.

B, The chorion.

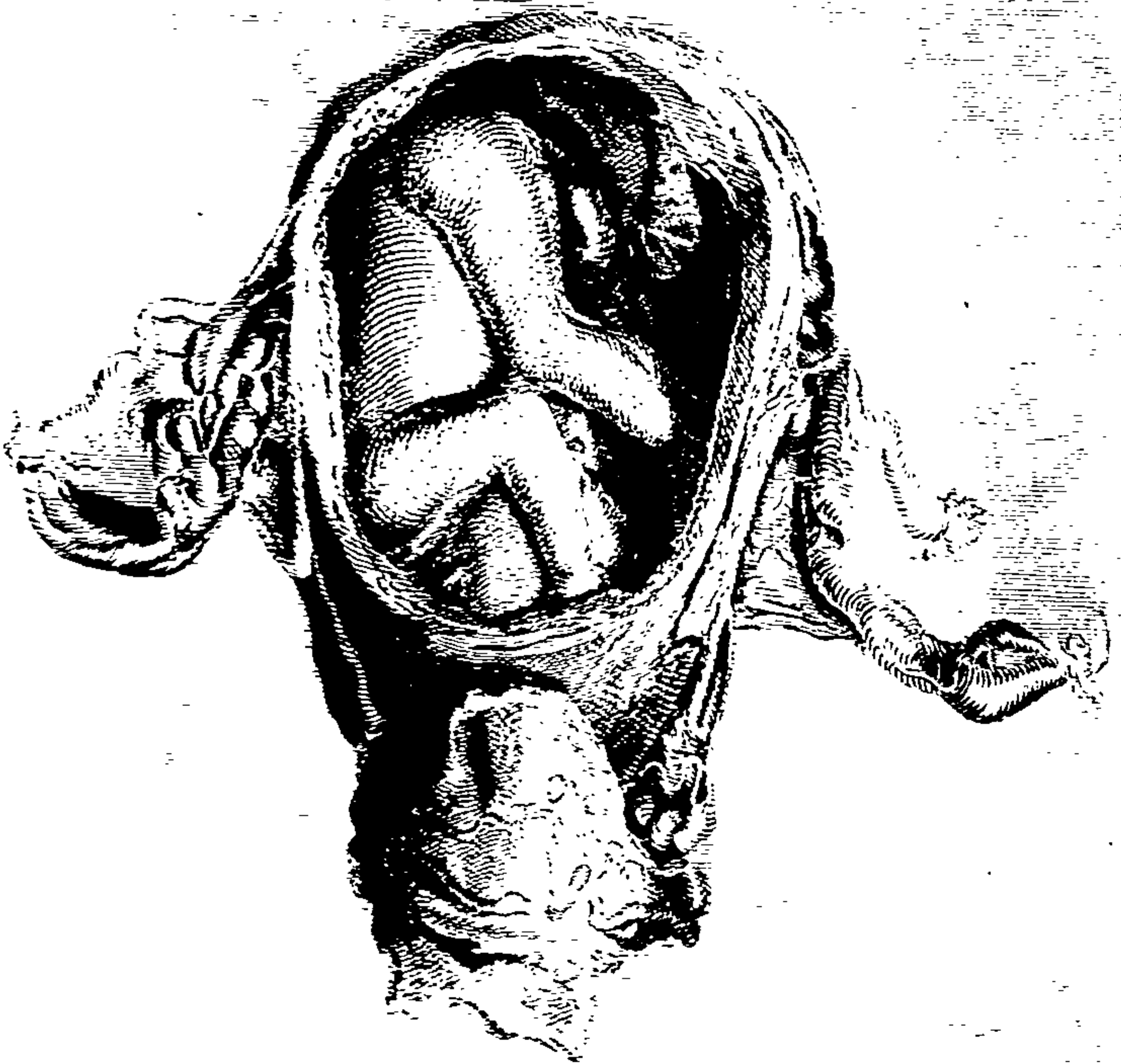
C, The decidua vera.

D, The surface of the placenta next the uterus.

The ovum at this period consists of three membranes, (the decidua reflexa being now obliterated), viz. the decidua vera, the chorion, and the amnion, a spongy vascular mass, the placenta, and a distinctly formed foetus surrounded by liquor amnii, in such proportion that the embryo can commonly touch the amnion, which it could not before this period do.—It is on this account that the first sensation of the motion of the child is seldom felt sooner than about the fourth month. Instances however have occurred, where this was
perceived

perceived even about the end of the eleventh or twelfth week. The vessels connecting the ovum to the uterus at this period, are so strong that they are difficultly lacerated by an increased impetus of the blood; and so large that, when divided, they discharge within a very short space of time a large quantity of blood.—The former circumstance renders abortions at this period rare, and the latter occasions much danger when that accident actually happens.

PLATE



P L A T E IX.

EFFECTS OF IMPREGNATION, CONTINUED.

THIS Plate represents a view of the Gravid Uterus, and its contents at the sixth month, copied from Dr Hunter's twenty-third plate.

The letters of reference are omitted; because, in the original, they relate to parts which, in this miniature, are too small to be distinctly seen.

Neither the cervix, nor os uteri, are exhibited; as the urinary bladder is represented to be left remaining.—This is of little consequence, seeing that the changes on the cervix and os uteri are not so regular as some authors have imagined.

The distance of the head of the infant, from the part at which it may be supposed the os tinæ was placed, explains the cause of the resistance commonly opposed to the progress of the child, in cases, where labour is by some accidental cause brought on at this and even a later period of gestation.

It is this circumstance which affords the strongest objection against the proposal of inducing premature labour in cases of deformity of the pelvis,
the

the great object of preserving the life of the infant being thus it is alleged frustrated.

But as the expedient alluded to ought only to be had recourse to, where there is a moral certainty, that no other means can be suggested for affording a probable chance of saving both mother and child, there seems to be no alternative. If children, brought forth at the seventh month of gestation, by women, the structure of whose pelvis obstructs irremediably the passage of a full grown infant, have been born alive; and if the operation by which labour can be excited at that period, have been proved by experience to be consistent with the safety of the woman, recourse to this expedient becomes a matter of necessity, not of choice.

P L A T E

Plate X.

Fig. 1



Fig. 2



P L A T E X.

EFFECTS OF IMPREGNATION, CONTINUED.

FIGURE 1st, Represents a section of the Uterus, with the Placenta turned back, to shew the manner in which the blood-vessels of the uterus are connected with the substance of the placenta.

A, The surface of the placenta turned back from the uterus.

B, A portion of the surface of the uterus, from which the placenta had been separated.

The nature of the connection between the uterus and the placenta, was first accurately discovered by Mr. John Hunter.—The following account of his discovery is inserted here, because it illustrates clearly the subject represented by this figure.

* “ The late indefatigable Dr Mackenzie, about
D the

* Vide observations on certain parts of the Animal Economy, by John Hunter, p. 37.

the month of May 1754, when assistant to Dr Smellie, having procured the body of a pregnant woman, who had died undelivered at the full term, had injected both the veins and arteries with particular success; the veins being filled with yellow, the arteries with red.

Having opened the abdomen, and exposed the uterus; he made an incision into the fore-part, quite through its substance, and came to somewhat having the appearance of an irregular mass of injected matter, which afterwards proved to be the placenta. This appearance being new, he stopped, and greatly obliged me, by desiring my attendance to examine the parts, in which there appeared something so uncommon. This examination was made in his presence, and in the presence of several other gentlemen whose names I have now forgotten.

I first raised, with great care, part of the uterus from the irregular mass above mentioned; in doing which I observed regular pieces of wax passing obliquely between it and the uterus, which broke off, leaving part upon this mass; and when they were attentively examined, towards the uterus, plainly appeared to be a continuation of the veins passing from it to this substance or placenta.

I likewise observed other vessels, about the size
of

of a crow-quill, passing in the same manner, although not so obliquely ; these also broke upon separating the placenta and uterus, leaving a small portion on the surface of the placenta ; and on examination they were discovered to be continuations of the arteries of the uterus. My next step was to trace these vessels into the substance of what appeared placenta, which I first attempted in a vein ; but that soon lost the regularity of a vessel, by terminating at once upon the surface of the placenta in a very fine spongy substance ; the interstices of which were filled with the yellow injected matter. This termination being new, I repeated the same kind of examination on other veins, which always led me to the same terminations, never entering the substance of the placenta in the form of a vessel. I next examined the arteries, and tracing them in the same manner toward the placenta, found that they made a twist, or close spiral turn upon themselves, and then were lost on its face. On a more attentive view, I perceived that they terminated in the same way as the veins ; for opposite to the mouth of the artery, the spongy substance of the placenta was readily observed, and was intermixed with the red injection.

Upon cutting into the placenta, I discovered in many places of its substance, yellow injection ; in others red, and in many others these two colours

mixed. This substance of the placenta, now filled with injection, had nothing of the vascular appearance, nor that of extravasation, but had a regularity in its form which showed it to be a natural cellular structure, fitted to be a reservoir for blood.

In some of veins leading from the placenta to the uterus, I perceived that the red injection of the arteries, (which had been first injected) had passed into them out of the substance of the placenta, mixing itself with the yellow injection."

FIGURE 2*d*, Exhibits a view of the heart of the foetus, in order to shew the foramen ovale.

A, The foramen ovale.

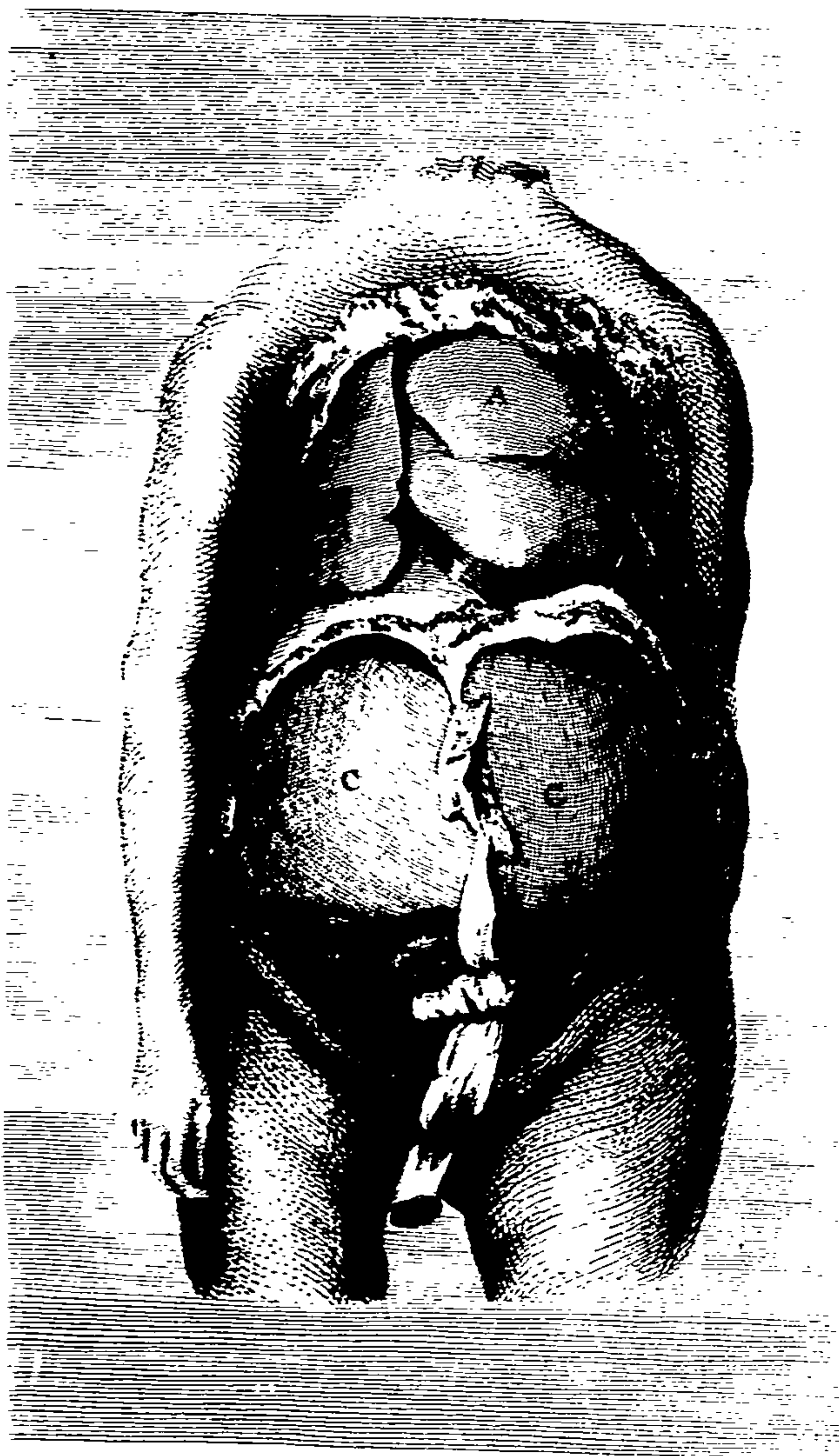
It has been long known, that in the partition between the auricles of the heart in the foetus, there is a considerable perforation of an oval shape, with a valve so attached to it, that a fluid may pass from the right to the left auricle, but not from the left to the right ;—and it has been commonly believed, that a portion of the blood brought to the heart by the *venæ cavæ*, actually does pass in this manner.

Speculating upon this theory, some physiologists have accounted for the power which the fishers of pearls, &c. acquire of remaining under water for some time without breathing, by supposing, that
in

in such persons the foramen ovale continues open.

A very strong objection however occurs against the opinion, that a part of the blood is sent to the left side of the heart through this foramen, *viz.* that it supposes the action of the auricles to be previous to birth, alternate, and not, as it afterwards is, synchronous. If this were the case, it may be asked, by what power is this alteration in the action of the heart accomplished on birth? Muscular motions habitually associated, are with much difficulty separated; and hence, were the action of the auricles alternate for nine months after conception, some very active power must be applied to interrupt the habit.

P L A T E



P L A T E X I.

EFFECTS OF IMPREGNATION, CONTINUED.

THIS Plate is designed to shew some of the peculiarities of the foetus.

A, The thymus gland.

B, The right lobe of the lungs.

C C, The liver.

The use of the thymus gland is not yet understood by physiologists.

As the lungs previous to the infant's breathing are found collapsed, it is obvious that the act of breathing is not first induced by the pressure of the atmosphere forcing the air into the lungs; and this is established beyond the possibility of doubt by the lungs of still-born children continuing collapsed.

The means which nature has contrived for beginning the operation of breathing seem exceedingly simple. The atmospherical air applied to the teguments of the face, about the lips and nostrils, stimulate the branches of the fifth pair of nerves there distributed; and these communicate the impulse to the intercostal nerve, the effect of which

which is, that the action of the diaphragm and intercostal muscles is excited. Thus a vacuum being produced in the lungs, the air necessarily rushes in.

Practitioners of midwifery have sometimes an opportunity of seeing a strong proof in favour of the above theory.—The infant is sometimes born with a portion of the membranes of the ovum covering the face. When this happens when the child is alive, although strong pulsation of the heart be felt, the infant makes no effort whatever to breathe; there being no perceptible action of the diaphragm or intercostal muscles; but the moment the membranes are removed from the face, breathing commences.

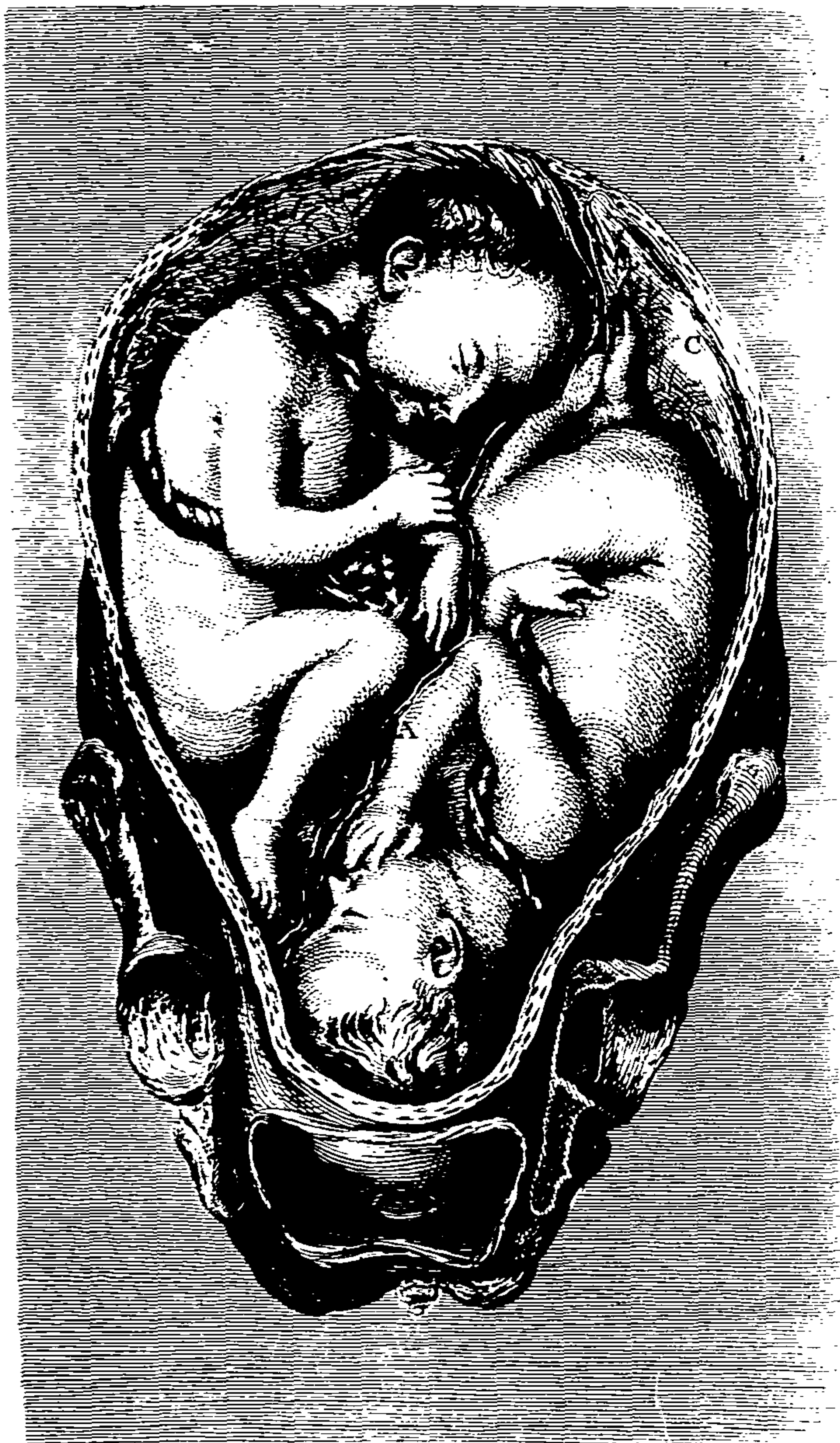
An additional argument for this explanation is afforded by the phenomena of incipient respiration, in cases where the infant, having been born in a state of suspended animation, is recovered. The breathing is at first remarkably interrupted; and an attentive observer may perceive distinctly, previous to each inspiration, the action of the diaphragm and intercostal muscles.

The liver is of a prodigious magnitude during the whole period of the foetal state, and indeed is of a large size for the first two or three years after birth. This natural circumstance has been sometimes mistaken for a diseased appearance.

That

That the liver in the foetus must perform some very important function cannot be doubted ; but that it has not the same connection with the chylipoetic viscera which it has after birth, is evident ; because it is of a large size, and possesses an apparent perfection of structure, while these viscera are scarcely organized.

The most probable conjecture that can be formed respecting the function of the liver in the foetus is, that it prepares something useful, or separates something noxious from the blood returned from the placenta by the umbilical vein ; for a considerable portion of that blood is distributed through the liver before it be transmitted to the heart.



P L A T E XII.

EFFECTS OF IMPREGNATION CONTINUED.

THIS plate is designed to shew the ordinary position of twins in utero, copied from Dr Smellie's tenth plate.

A, The membranous septum between the cavities in which each foetus was contained.

B C, The placenta here represented to be connected together, and attached to the fundus uteri.

In cases of plurality of children, each foetus is inclosed in a distinct membranous bag, composed of the amnion and chorion, and is surrounded by a quantity of liquor amnii proper to itself. The spongy chorion as usual, lines the whole internal surface of the uterus, and hence affords a covering to the membranes immediately containing the several infants. It is this circumstance which prevents parts of different children from being frequently found at the same time in the passage during labour.

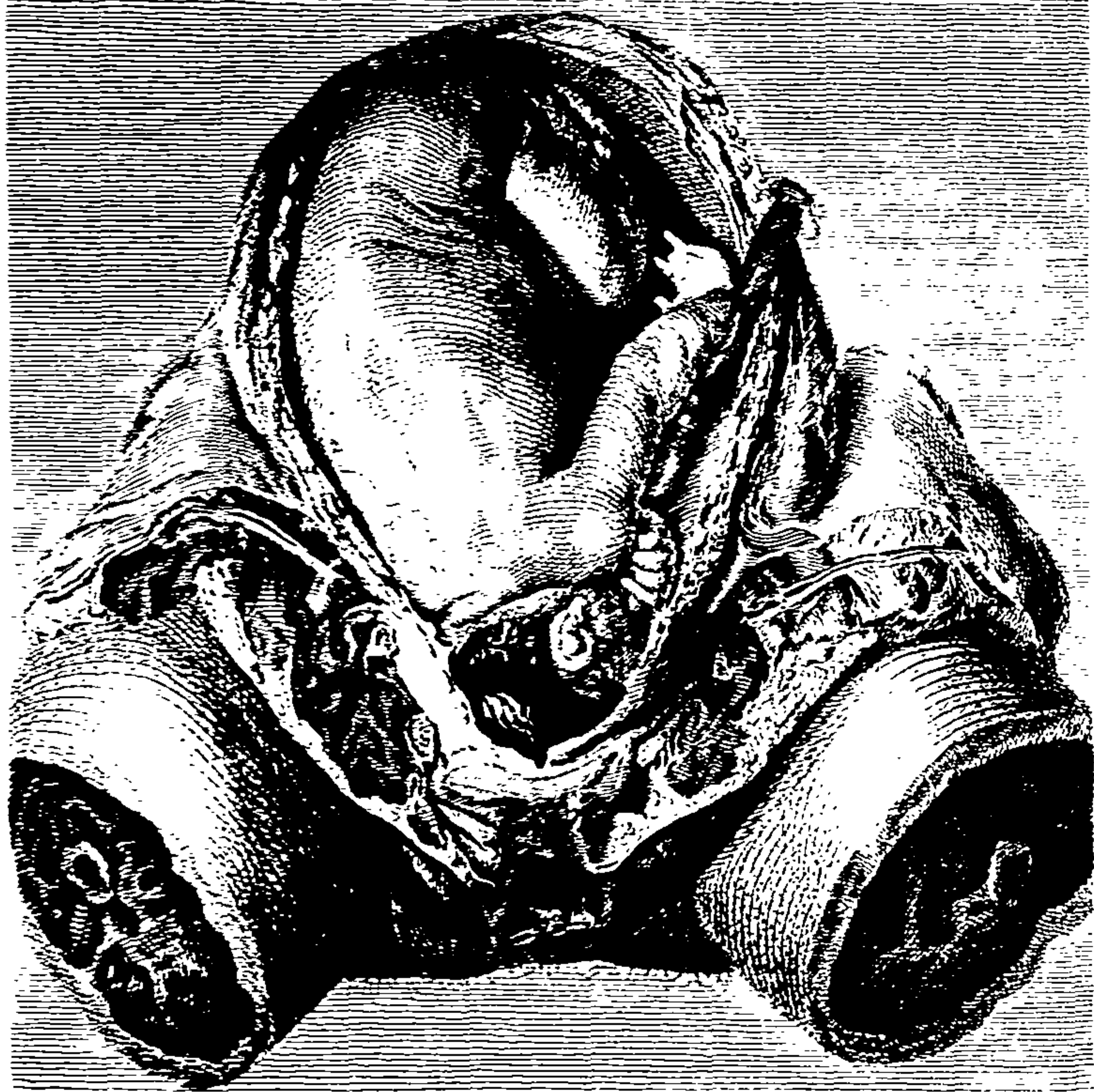
Innumerable observations have proved, that the position delineated in this plate, is the ordinary one

of twins, and as no instance has hitherto been recorded where twins were observed to be differently situated in utero, it is perhaps their constant position, that is to say, the head of the one is placed directly opposite to the feet of the other, turned back on its breech.

Should this be established, it must follow that in those cases, when each twin child is born in the natural way, the position of the second infant is altered by the action of the uterus, probably during the expulsion of the first born.

The position of triplets has not yet been ascertained. The most plausible conjecture on the subject seems to be, that the third child is placed between the head and the breech, or, more properly speaking, feet of the two others.

The placenta in cases of plurality of children, are commonly connected, and sometimes so intimately, that the vessels anastomose.—Sometimes, however, each placenta is perfectly distinct, and attached to a different part of the uterus.



P L A T E XIII.

EFFECTS OF IMPREGNATION, CONTINUED.

THIS plate represents the natural position of the Child in Utero, at the full period of utero-gestation. It is copied from the beautiful plate executed by Strange, which forms the sixth of Dr Hunter's collection.

All the forepart, both of the womb and of the secundines, (which included the placenta) and the upper part of the urinary bladder, are removed. The navel string is cut, tied, and turned to the left side, over the edge of the uterus. At the fundus, the investing membranes are likewise turned over the edge of the womb.

The head of the child is lodged in the lower part of the uterus, being partly within the cavity of the pelvis, and its body lies principally in the right side. Its position is diagonal or oblique, so that its posterior parts are turned forwards, and to the right side of the mother, and its posterior parts are directed backwards and to the left side. Its right foot appears between its left thigh and leg. Its body was covered with the white greasy mucus, commonly

monly seen on children at birth. This is represented at the upper part of its back, where it was intersected with lines from the wrinkles and motions of the child's body. Every part is represented just as it was found ; not so much as one joint of a finger having been moved, to shew any part more distinctly or to give a more picturesque effect.

Such is nearly the description given by Dr. Hunter of this plate.

The first object which attracts notice in this beautiful representation, is the position of the child. It is somewhat different from what it is represented to be in plates eighth and ninth, being more lengthened out. This is a curious circumstance, as the proportion of liquor amnii having greatly decreased, the situation of the child is more confined, and hence, it might be imagined the several parts should be more completely compacted together.

The cause of this alteration in the position, perhaps is the weight of the head, together with the resistance opposed by the promontory of the sacrum to the descent of the shoulders.

The effect, whatever be the cause, is highly beneficial ; for the head of the child is thus placed in the situation most favourable for delivery, being in the direction of the longest diameter of the pelvis in the living subject.

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The next circumstance that would probably strike an observer, is the unsupported state of the fundus uteri. The ligaments remaining at the brim of the pelvis, almost three fourths of the uterus, are unconnected with any other part. As the placenta is very commonly attached to the fundus, this renders partial inversion of the uterus not an uncommon accident in the hands of ignorant operators. And it must be obvious, that little force is required to invert all that portion which is above the ligaments. A degree of force, on the contrary, is necessary to separate the uterus from its attachments to the sides of the pelvis, and thus, to completely invert and pull it out of the body, which it were impossible to believe could have ever been exerted on the living subject, did not the most incontestible evidence convince us of the fact.

It must however be allowed, that by far the greater number of cases recorded by practitioners as instances of complete inversion are actually examples of partial inversion. The phenomena invariably described in such cases unequivocally prove it. In complete inversion there can be little or no hæmorrhagy, because the vessels which principally supply the uterus with blood must inevitably be torn away from the sides of the pelvis, and hence separated from their source: Yet hæmorrhagy is generally described as the most alarming symptom in those histories of inverted uterus.

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The unequal thickness of the parietes of the uterus in different places, although not very distinctly marked in this plate, ought always to be kept in view by a practitioner. This, together with the spongy texture of the substance of the uterus, renders the operation of turning always attended with the risk of the hand being forced into the abdomen among the intestines.

PLATE



P L A T E XIV.

PHENOMENA OF PARTURITION.

THIS plate, copied from Dr Smellie's twelfth plate is designed to represent the situation of the child, and state of the passages during the latter part of the first stage of labour.

A B, The os uteri in a state of dilatation.

The situation of the child here delineated is not that which takes place at the beginning of natural labour, but is that which is occasioned by the strong action of the uterus, when the dilatation of the os tincæ is considerably advanced; and before the liquor amnii is discharged.

The natural position when labour begins is represented in Pl. xiii. ; for which reason it was placed immediately before that at present under consideration. To understand the infant's position relatively to the cavity of the pelvis, (which cannot be done by looking at Pl. xiii.), let it be supposed that, in this plate, the head is in contact with the os uteri, A B.

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The first effect of the uterine action in natural labour, is to separate the parietes of the os tincæ, and hence to discharge the mucus which had from a very short time after conception closed up that orifice.

When the diameter of the opening thus made is somewhat enlarged, a portion of the membranes containing the liquor amnii is forced though into the vagina during every pain. This membranous bag distended with fluid gradually becomes larger, and extends lower in proportion as the edges of the os tincæ are separated from each other. When this orifice is nearly opened to its full extent, the bag is during every pain forced forward, while, at the same time the head of the child mounts upwards out of the cavity of the pelvis, as is represented in this plate. On the cessation of the pain the membranes become flaccid, the liquor amnii recedes, and the head of the infant falls down apparently by its own gravity into the pelvis, so as to be in contact with the os uteri.

The dilatation of the os uteri, and the protrusion of the membranous bag afford the only certain marks by which the commencement of labour can be ascertained; and therefore, unless a practitioner is certain that either of these circumstances has happened, he cannot pronounce a patient to be in labour, whatever other symptoms may be present.

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The protrusion of a membranous bag, however, is not of itself an unequivocal symptom of the commencement of labour ; for sometimes during the latter weeks of gestation, violent pains take place similar to those of labour, and the vesica urinaria is forced down, imitating very exactly the bag formed by the membranes of the ovum.

This fact was first explicitly pointed out in a late publication, by the author of these remarks *. As he considered the observation to be of essential practical utility, he used the following expressions in that work, which he here takes the liberty to repeat.

“ By this fact, an important precaution is suggested ; for, if the practitioner be not aware of the circumstance, he must not only frequently keep his patient in a state of unnecessary alarm for many days ; but even also may injure her irreparably, by lacerating the bladder.”

He has been consulted in many cases of incontinence of urine, from this cause, where he had to regret, that the occurrence alluded to is not more generally known among practitioners.

The bag formed by the protrusion of the urinary bladder, may be readily distinguished by the operator,

* Select cases of midwifery, extracted from the records of the Edinburgh General Lying-in Hospital, with remarks by J. H. Jun. M. D. See p. 15.

rator, feeling it impossible to pass the finger all round its circumference as he can, when the membranes of the ovum are protruded, for it is attached firmly to the fore-part of the pelvis; and by his being able, during the interval of a pain, to feel the os tinæ quite undilated or nearly so.

PLATE



P L A T E XV.

PHENOMENA OF PARTURITION, CONTINUED.

THIS plate exhibits the situation of the child during the beginning of the second stage of natural labour. It is copied from the thirteenth table of Dr Smellie.

Soon after labour has advanced as much as is represented in Plate XIV, the membranes give way during a pain, the os uteri is completely dilated, and the head of the child, partly protruded through it, is forced down, so as to occupy almost entirely the cavity of the pelvis. This is the situation represented in this plate.

The face is here turned towards the left sacro-iliac synchondrosis, the chin being applied close to the top of the breast, and the vertex is directed towards the body of the right ischium.

In this position the long diameter of the child's head is in the direction of the long diameter of the cavity of the pelvis, while the head at the same time occupies the least possible space, the vertex presenting:

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The former circumstance is occasioned by the original situation of the child at the commencement of labour, not as the ingenious Saxtorph has alledged from the shape of the promontory of the sacrum. The latter is the consequence of the neck being joined to the head nearer to the occiput than to the face ; for the effect of the uterine action exerted on the body of the child being applied to the head at that part, forces forward the vertex.

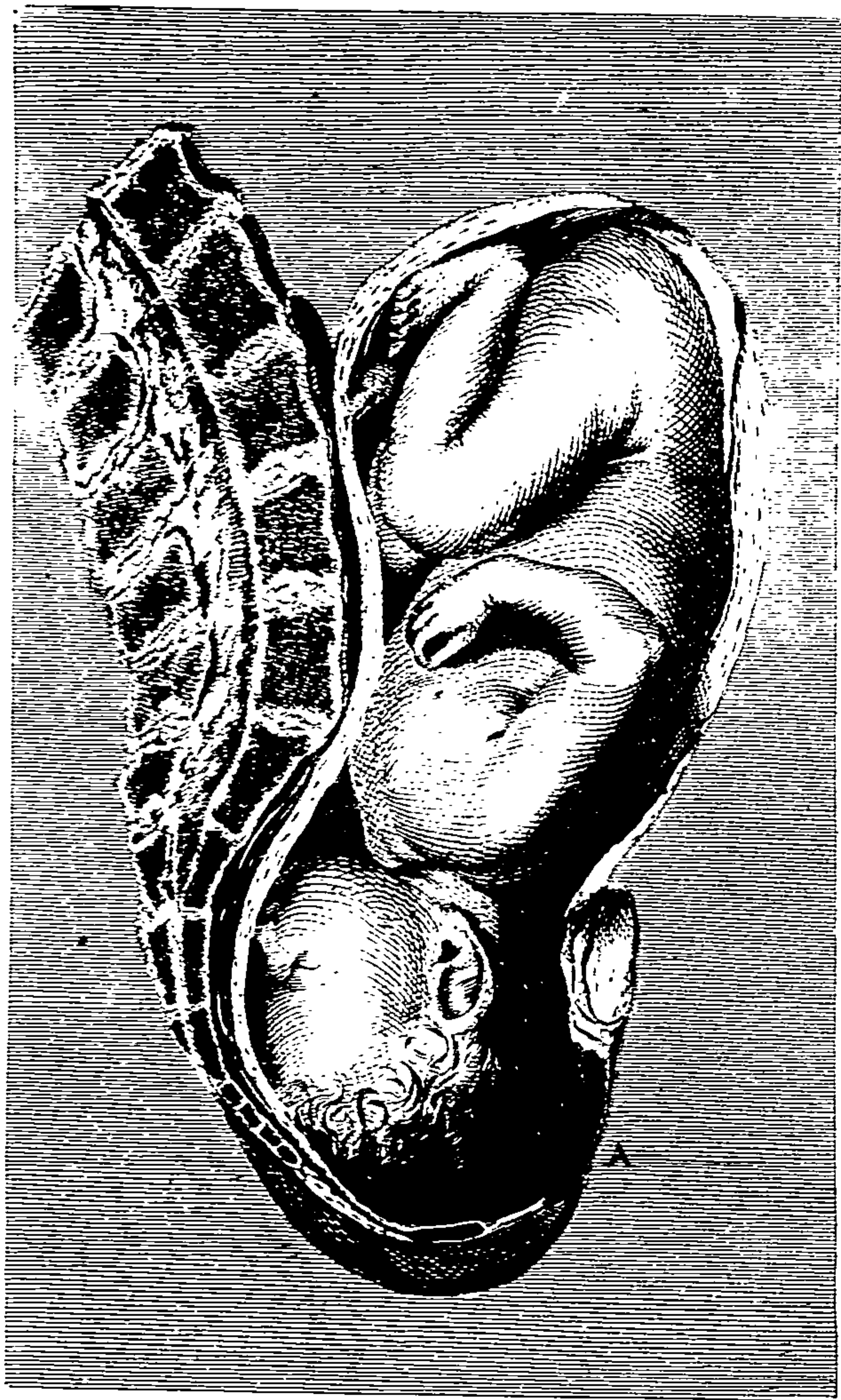
Two obstacles prevent the further descent of the head in the same direction, first and principally, the spinous processes of the ischia, and secondly, the shoulders being applied to the pubes and sacrum.—The effect, therefore, of the continued action of the uterus at this period of the labour, is to turn the head gradually into the situation in which it is represented in the following plate.

When it becomes necessary to apply the forceps, where the child is in the position exhibited in this plate, it is absolutely necessary to know to which side of the pelvis the face lies. The tumour commonly formed on the vertex, is, to an experienced practitioner, a sufficient mark by which this may be ascertained ; but this can never be depended on by others, because it requires a great deal of practice to be able to distinguish between
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the natural tumour on the vertex, and a tumour that pretty often is felt on the forehead.—The best general rule, therefore, is to feel the position of the ear, by passing a finger of the right hand under the pubes.

P L A T E

Plate XVI.



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P L A T E XVI.

PHENOMENA OF PARTURITION, CONTINUED.

THIS plate, copied from the fourteenth of Dr Smellie, represents the situation of the Child during the latter part of the second stage of Natural Labour.

A, The external parts.

This plate is designed to shew that alteration in the situation of the child, which, it has been already noticed, takes place soon after the head has been in contact with the spinous processes of the ischia, as exhibited in the preceding plate.

The circumstances which prevent the further progress of the child, in the same direction in which it had entered the pelvis, have been explained; but the reason why the face turns into the hollow of the sacrum, in preference to the opposite part of the pelvis, remains to be stated. It is the effect of the unequal pressure of the spinous processes of the ischia on the sides of the head: for the process, on one side, presses on the edge of the parietal bone next the forehead; and the other, on the opposite

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side,

side, presses on that edge of the corresponding bone which is next the occiput.—This Dr Osborn has clearly pointed out in the following passage.

“ This unequal pressure of the two ischia upon the head will, in the first instance, direct the occiput or apex of the cone to turn under the arch of the pubes, where there is little or no resistance ; while the pressure of the other ischium, in its farther descent, will have the same effect on the other side, and direct or compel the face to turn into the hollow of the sacrum *.”

By this alteration in the position of the child, the long diameter of the head is applied to the long diameter of the outlet of the pelvis, while the shoulders are made to enter the brim ; and at the same time the head is so placed, that the continued contractions of the uterus have the effect of forcing it out like a cone with its apex foremost, by which the soft parts are opened in the most gradual, and consequently least injurious, manner.

In the plate at present under consideration, the chin has already in some degree receded from the top of the breast, on which it had hitherto rested. In the further descent of the head, it is made to separate from that part as far as the mechanism of the child will permit. In proportion as the chin
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* Vide Essays on the Practice of Midwifery, by William Osborn, M. D. p. 31.

thus recedes, the occiput turns up towards the abdomen. A pretty accurate idea of the curved line, which both the chin and the occiput describe during the gradual exit of the head, may be formed, by supposing that, in this plate, the chin is brought to a point a little below the inferior edge of the external parts, A.

The vertex is thus made, in its descent, to pursue a different line of direction from what it does at first, in consequence of the resistance opposed to it by the coccyx and perinæum. This forces it from the axis of the pelvis into that of the vagina ; so that the superior part of the skull being pressed upon by these parts, the head is, by the continuation of the vis a tergo, turned upon the centre of the arch of the pubes (to which the occiput is closely applied) as upon a fulcrum.

If this explanation of the process be just, it follows, that pressure on the perinæum during the time that the soft parts are protruded in form of a tumour, instead of retarding the progress of the child's head ought to accelerate it ; and experience proves this to be actually the case.

This plate affords a demonstration of the superiority of the curved over the straight forceps ; for, as each blade of that instrument ought to be applied over the middle of the parietal bone, in order to embrace the short diameter of the head, this could not be accomplished with the straight
forceps,

forceps, when the child is in the position here represented (and it is the most common case in which the forceps is had recourse to), unless the handles were brought almost into contact with the point of the coccyx.

PLATE



P L A T E XVII.

PHENOMENA OF PARTURITION, CONTINUED.

THIS Plate, copied from Dr Smellie's thirtieth table, exhibits a view of the most common position of the child in presentations of the breech, which are the most frequent cases of preternatural labours.

In this case, although the long diameter of the presenting part of the child be not in the direction of the longest diameter of the pelvis at the brim, nevertheless, when the uterine contractions are vigorous, and the mother and child are of the standard proportions, the breech advances pretty rapidly down to the outlet. It is then stopt, because the largest diameter of the presenting part is then applied to the shortest diameter of the pelvis; and hence a prodigious propelling force is required to expel it in this direction, the consequence of which, is in many cases, the death of the child, by the long continued compression of the umbilical cord.

When

When the unassisted contractions of the uterus are inadequate to the expulsion of the infant in this presentation, three modes of practice have been recommended, viz. the use of the hands, or of a fillet, or of instruments.

Assistance may often be afforded, by passing two fingers up at one side over the groin, and pushing the child to the opposite side of the pelvis, during a pain, and on the succeeding pain passing the fingers of the other hand in the same manner, and so on alternately.—But, in many cases, the resistance is too great to be overcome by these gentle efforts.

Many practitioners apply, in such cases, a garter or fillet over one or both groins; but it will seldom be found that this expedient is consistent with the safety of the child: for the cause of resistance is not merely the suspension of the propelling powers; it is the long diameter of the presenting part being in the direction of the short diameter of the pelvis. Although, therefore, by the exertion of a great degree of force in pulling by the fillet, the breech may be brought through the outlet, the violent compression thus occasioned will most commonly prove highly injurious, if not absolutely fatal, to the infant.

The use of the instrument that has been most generally employed in these cases, by British practitioners, the blunt-hook, is attended with the same disadvantages,

disadvantages, with this additional inconvenience, that, even where it is only required to supply or increase the vis a tergo (the resistance from the presenting part, and the state of the passages being inconsiderable), its pressure on the groins of the infant is apt to tear or bruise those parts.

For these reasons, the forceps have been recommended by some practitioners, and are now exclusively employed under the circumstances alluded to by the author of these remarks. The manner of using them is exceedingly simple. The blades are applied after the presenting part has descended to the outlet of the pelvis, over the sides of the child's breech, (thus resting partly on the outside of the thigh, and partly on the haunch) with their convex edges towards the hollow of the sacrum. They are locked and secured in the ordinary way. In drawing down, the handles are gradually inclined to one side; so that the long diameter of the child is directed into the long diameter of the outlet, or, in other words, the belly of the infant is by degrees, during the process of extraction, turned towards one side of the pelvis. It is unnecessary to add, that all the general rules established for operating with the forceps are attended to.

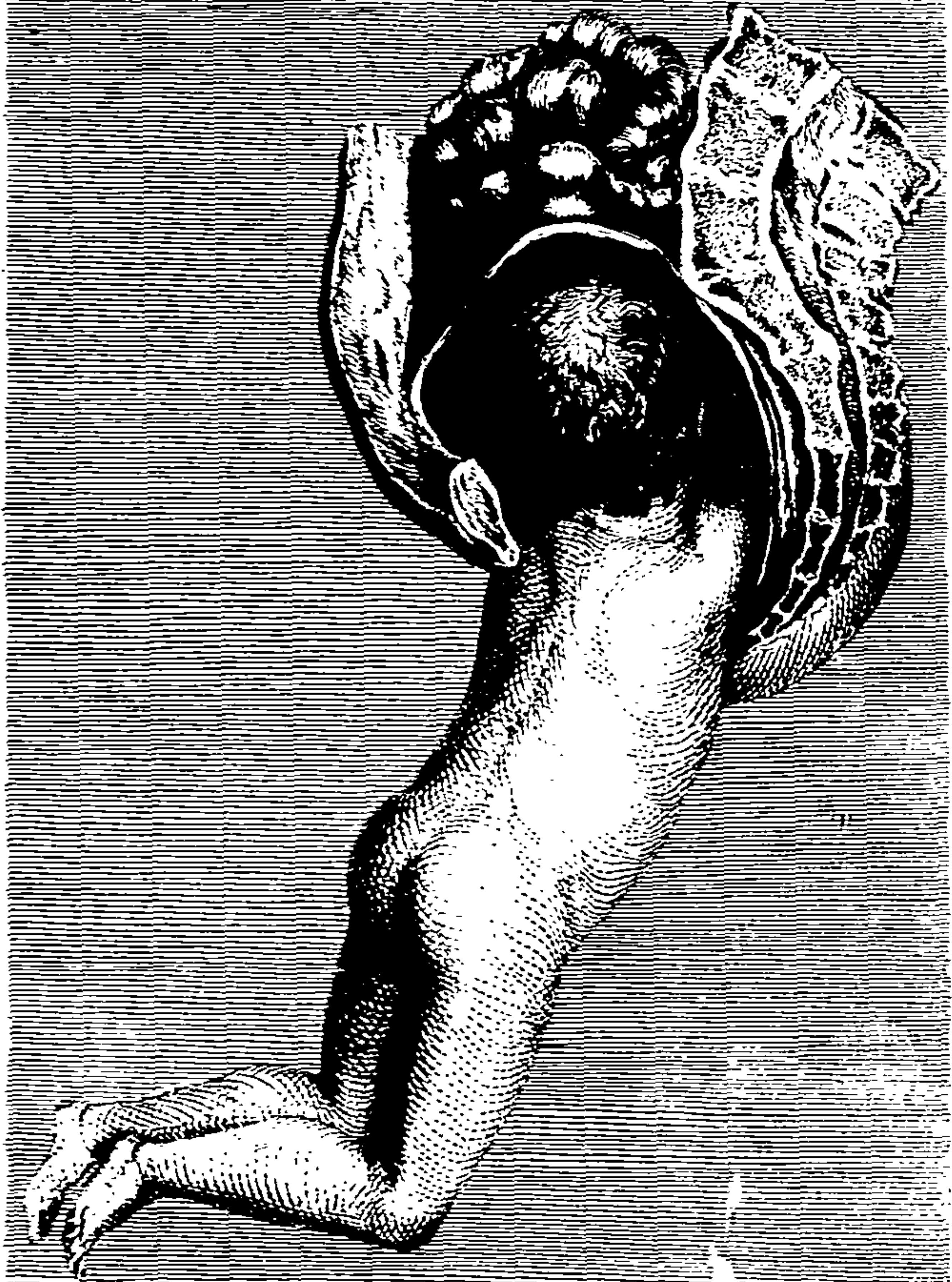
It has been urged against the use of the forceps in breech cases, that their pressure is liable to injure the breast of the infant, or that the hold afforded by the blades is so insecure, that the instruments

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nts flip every time the operator attempts to draw down.

The former of these objections is inapplicable to the short forceps, and indeed has been suggested by those who employ the unweildy instruments of Levret. And experience will convince every unprejudiced practitioner, that the latter is unfounded. To those who adduce the argument of the instrument flipping from what has happened under their own management, it may be replied, that either the blades of the forceps they had used must have been too narrow to embrace by a number of points of contact, or that they had not adverted to the great power which the application of the forceps in these cases bestows, that of accomodating the presenting part to the passage.—In short, that they had endeavoured to bring forward the child as it presented, instead of turning to one side, on the principles explained.

P L A T E



P L A T E XVIII.

PHENOMENA OF PARTURITION, CONTINUED.

THIS plate is designed to shew the position into which the child is to be brought, during the process of extraction, in footling cases.

The principal rules for assisting in presentations of the feet, are applicable to all cases of preternatural labours; because a child of the ordinary size cannot be made to pass through the pelvis in any other position, than with the head or lower extremities foremost; and experience has shewn, that, in deviations from the natural presentation, it is infinitely preferable to bring down the feet than the head.

The general principle to be adopted in the management of footling cases, is to direct the largest diameter of the child through the largest diameter of the pelvis.

When the shape of the pelvis in the living subject, and of the body of the infant, are attentively considered, it must be obvious, that if the belly of the child be either to pubes or sacrum, this object

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cannot

cannot be attained, since the broadest part of its body is thus made to pass through the short diameter at the outlet.—On the other hand, if the belly be directly to either side of the pelvis, although the child be in the position the most favourable to pass through the outlet, the large diameter of its body is applied to the short diameter of the brim.

But, if the child be so placed, that its belly, its breast, and its face, are directed in succession towards the sacro-iliac synchondrosis of one side, it can then be propelled through the pelvis with the least resistance, as it occupies the least possible space.

Accordingly, the author of these remarks has for many years suggested, that, in all preternatural labours, the infant should be gradually brought into this most favourable position, turning to that sacro-iliac synchondrosis, to which the parts mentioned lie the nearest.—Where they are equidistant from each synchondrosis, they should be directed towards the left one; for, if the patient be in the proper position (on the left side), then the operator can finish the delivery with his right hand.

In this plate, the infant is represented as having been propelled along the right sacro-iliac synchondrosis, until the breast was excluded.—To accomplish the delivery under such circumstances, it is necessary to disengage the arms, beginning with that nearest the sacrum; next wrapping the body in a
soft

soft warm cloath, to lay it along the left arm, carrying up two fingers of the corresponding hand into the infant's mouth, and applying the fingers of the right hand so as to embrace closely the neck at the posterior part over the shoulders; then, first bringing the head in the same position completely into the cavity of the pelvis, to turn the face into the hollow of the sacrum; and finally, by pressing on the lower jaw, and at the same time inclining the body up towards the abdomen of the woman, to disengage first the face and then the occiput.

By adopting these rules, the resistance to delivery after the lower extremities are protruded, so commonly complained of, will seldom be experienced, and a much greater proportion of infants will be born alive in preternatural presentations, than can be expected where the directions generally given are followed.

F I N I S.