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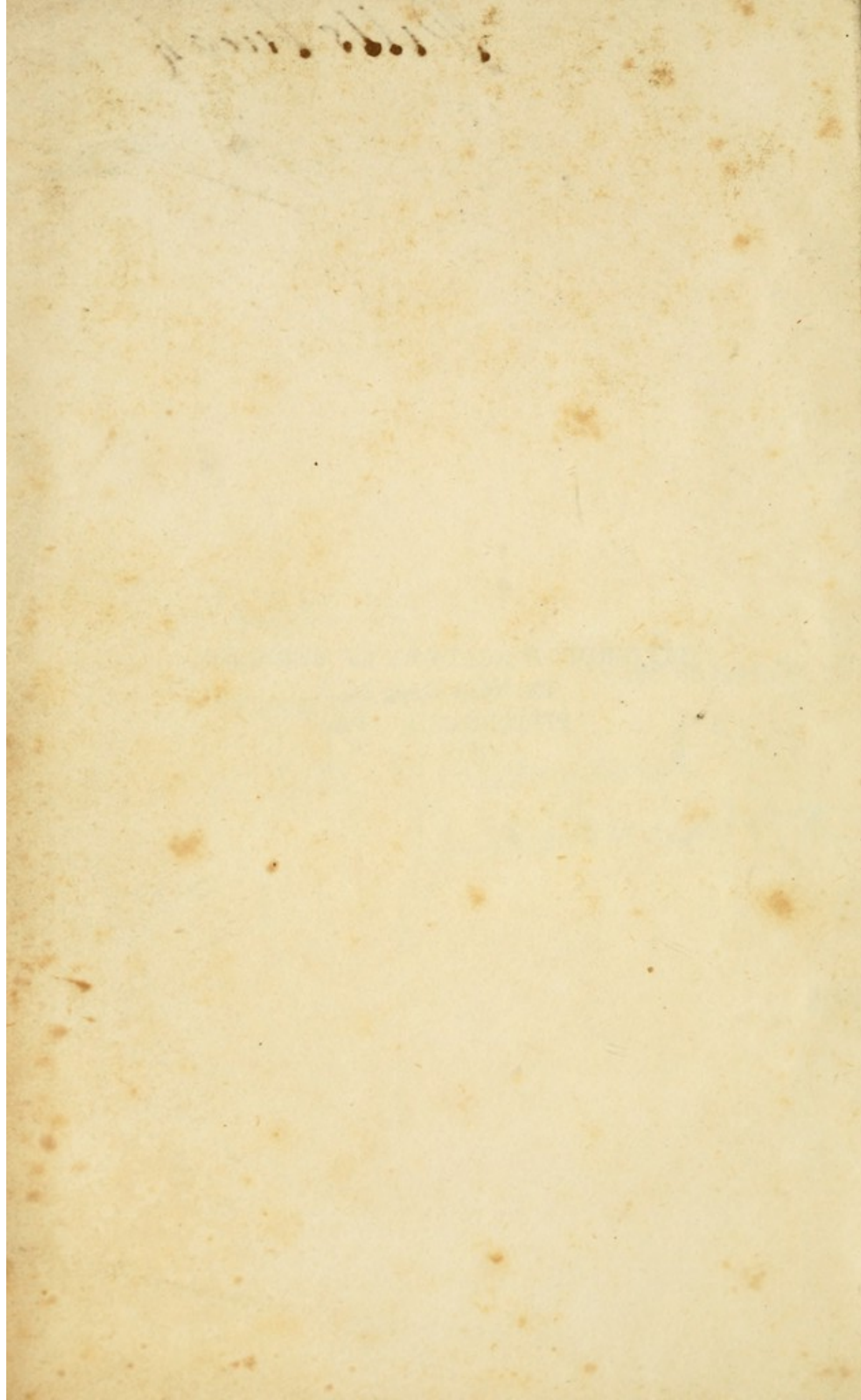
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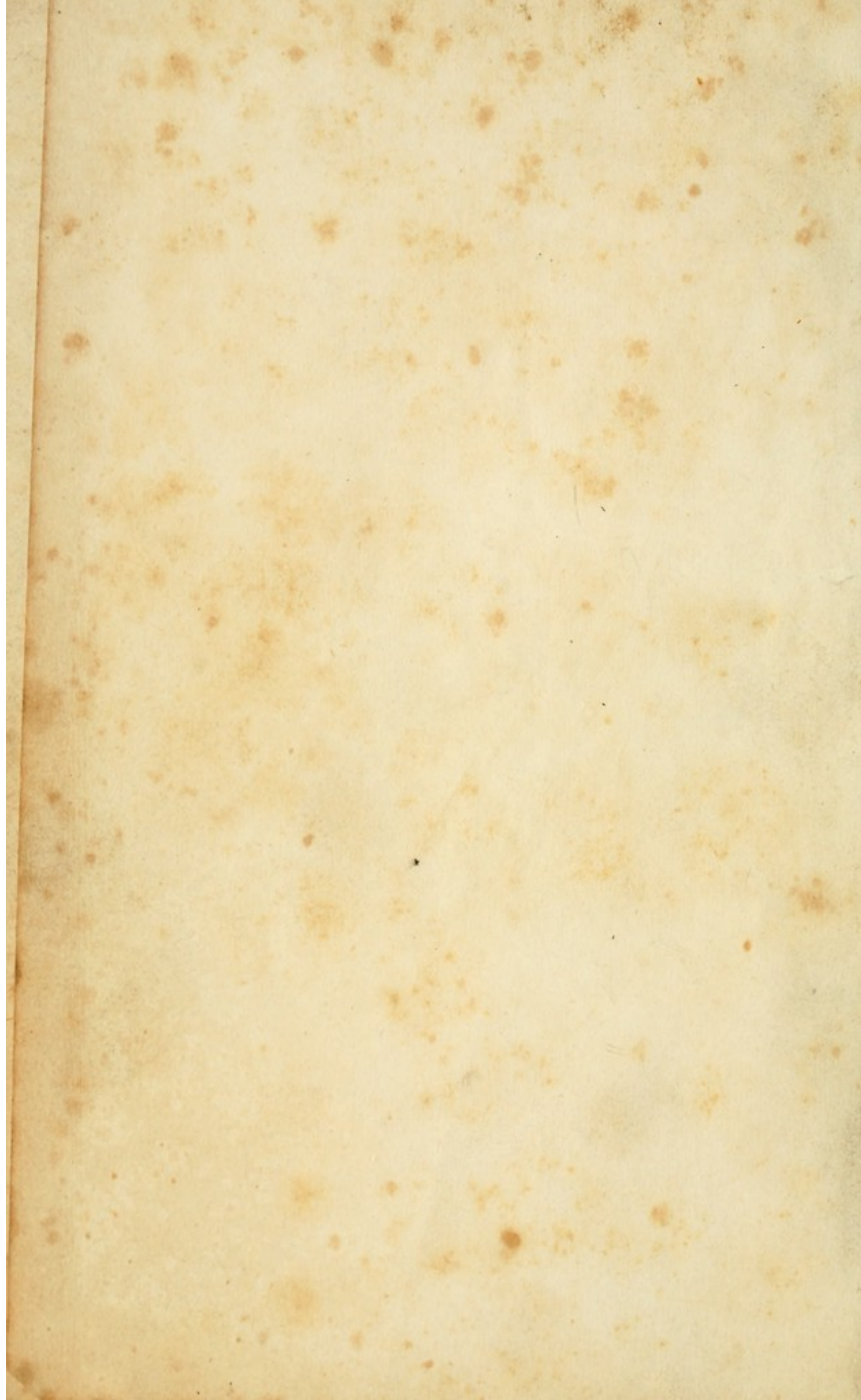
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THE

Jno. S. Mearns
1848

PHILADELPHIA

PRACTICE OF MIDWIFERY.

BY

Glucena

CHARLES D. MEIGS, M.D.

LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN; MEMBER
OF THE AMERICAN PHILOSOPHICAL SOCIETY; AND OF THE
PHILADELPHIA MEDICAL SOCIETY.

WITH NUMEROUS ENGRAVINGS.

PHILADELPHIA:

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TO

RENÉ LA ROCHE, M.D.

MY DEAR LA ROCHE :

I dedicate my book to you, and it is due to you that I should explain the motives which have led me to its publication. I shall, therefore, state very briefly, that, having for several years been engaged in delivering lectures on Midwifery and the Diseases of Women and Children, in this city, I have been repeatedly asked to publish a volume on Obstretic subjects, adapted to the use of students of medicine; and engaged, in consequence of a written request from members of my class in the Philadelphia School of Medicine, to make a publication upon subjects connected with my course of lectures.

Inasmuch as I had very often gone over with my classes the consideration of the principal topics bearing on this branch of medical studies, I thought myself sufficiently informed upon all the theoretical parts of it to warrant me in undertaking to write for the use of beginners, at least; and felt assured that my opportunities for acquiring clinical knowledge were such, that, if they should have been properly improved, they could not but have qualified me to express my thoughts in this way.

The volume is so small that you will not expect to find in it full and copious details on all the subjects

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usually treated of. I have been obliged to make some of the articles so very brief, as to render them less useful than they ought to be, or perhaps absolutely meagre. Nevertheless, the directions which will be found here are such as I have had reason to approve of, upon a good share of experience and reflection: and, as I wrote principally with the expectation of affording some help to the student of this important department of our profession, I sincerely hope that he may find the explanations and directions worthy of his confidence, and, in some measure, conducive to his advantage.

It may, perhaps, be said that we do not want any more works on Midwifery, or, at least, systematic works. I admit that the valuable publications of Dr Dewees might serve as a reinforcement to such an objection. There is also the work of M. Velpeau, which I translated from the French, and published in this city a few years ago: a work so excellent, that it has almost become a text-book, as I am informed. These, and several new publications in England and Ireland, might have served as inducements for me to avoid troubling my brethren with the offer of this volume, perhaps an additional burthen to their book shelves. However, having condensed, as far as I could, the several subjects treated of in it, and having made it rather an expression of my own reflections and experience, than a dry compilation of materials to be found everywhere in the Obstetric library, I venture to offer it to my brethren, especially the younger among them, in the hope that at least some parts of it may not be found wholly devoid of interest, nor to be perused without profit. To you, my kind friend, I offer it, with the confident hope that you will pardon its faults. I most sincerely wish it were far more worthy of your acceptance; or fit to be a measure of the esteem and affection of

Yours, &c.

CHARLES D. MEIGS.

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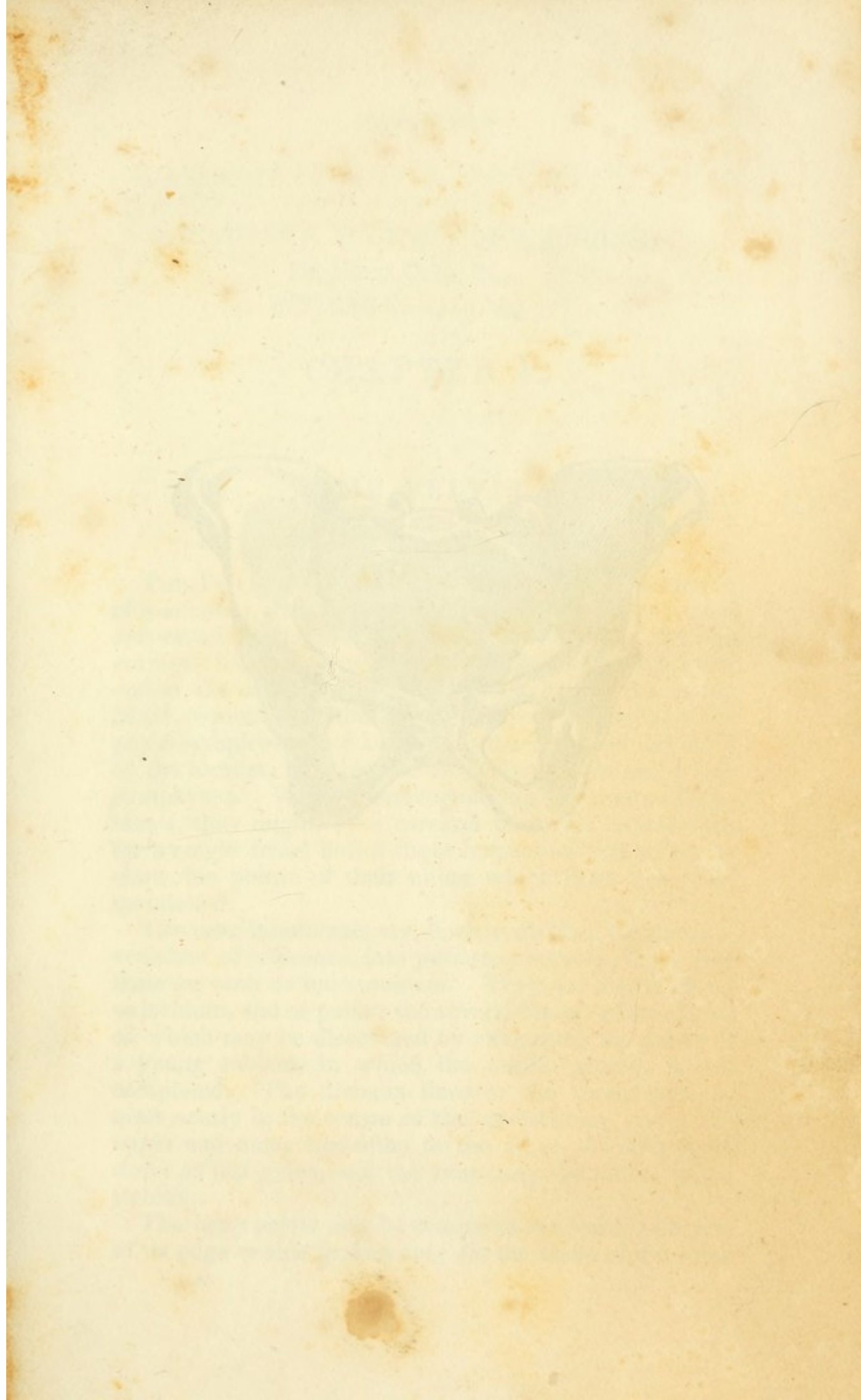
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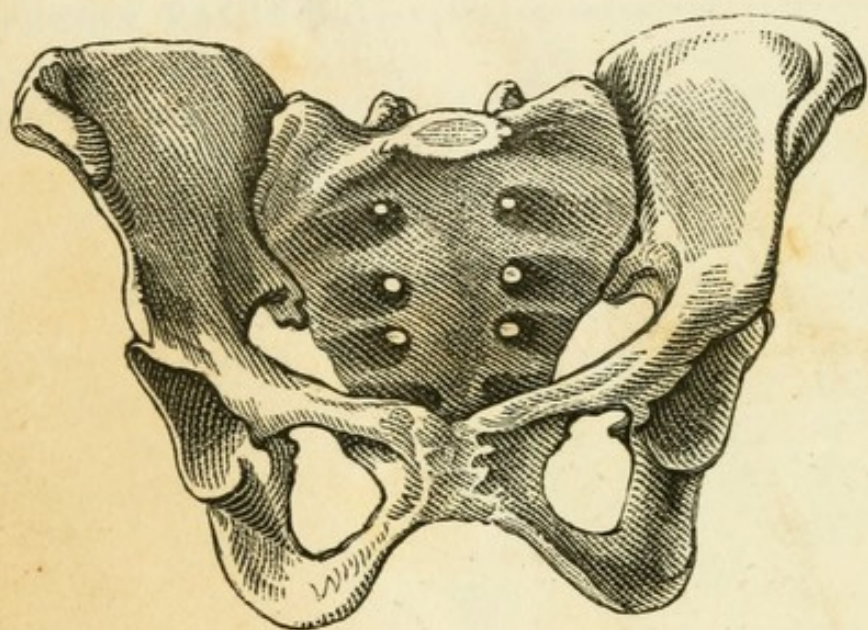
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CHAPTER I.

THE PELVIS.

THE Pelvis consists of an irregular canal, composed of four bones, that are firmly united, in the adult, by what are called the symphyses. These bones are, 1st, the sacrum; 2d, the coccyx, which is attached to the lower end of the sacrum; 3d, the two ossa innominata or hip bones, which are united to each other, in front, by the pubic symphysis, and behind, to the right and left sides of the sacrum, by what are denominated the sacro-iliac symphyses. When bound together by their natural ligaments, they might, by a careless observer, be mistaken for a single bone, but, a slight inspection will suffice to show the points of their union which have been just mentioned.

The ossa innominata are, further, divided, for the convenience of reference, into portions; namely, three portions for each os innominatum. They are the os ilium, os ischium, and os pubis; the several limits or boundaries of which may be discovered by examining the pelvis of a young subject, in which the ossific growth is not completed. The division lines of the three portions meet nearly in the centre of the acetabulum, giving the upper and outer two-fifths to the ilium, one-fifth anteriorly to the pubis, and the remaining two-fifths to the ischium.

The bony pelvis may be compared to a basin with part of its edge or side broken out; for the crista of the ilium

advances scarcely beyond the transverse diameter of the bowl, leaving a vacant space in front, which in the living subject is occupied by the abdominal muscles. *See the figures of the pelvis.* The sides of the basin are composed of the costæ of the ilia, and the back part is filled up by the lumbar vertebræ: thus representing, as I have said, a bowl with its side broken out. The pelvis is commonly divided into the upper and lower basin—the division betwixt the two being clearly marked by a line, margin, or brim, running right and left, round the sides and back of the pelvis, from the top of the pubis to the front of the articular surface by which the sacrum is joined to the last lumbar vertebra. This line is denominated the linea ileo-pectinea, or ileo-pubic line. It defines the superior strait.

Upon looking downwards into the pelvis, below the linea ileo-pectinea or superior strait, a cavity is perceived, which is called the lesser basin, or, more properly and technically, the excavation. The excavation is bounded above, by the linea ileo-pectinea, behind, by the sacrum and coccyx, on the sides by the ischia, and in front by the pubis. As the sacrum, with its appendage, is more than five inches long, the ischia three and a half inches, and the pubis only one inch and a half in length, it is evident that the excavation is much deeper behind and on the sides, than in front. The finger can reach above the strait in front, whereas the hand must be introduced, to reach up to the top of it behind.

The outlet of the pelvis, called the perineal or inferior strait, is bounded by the under and inner edges or lips of the pubes, ischia and coccyx. In the dried pelvis it is of a most irregular shape, furnishing, in front, a large notch called the arch of the pubis, and two very deep indentations or notches in the sides, which have received the appellation of sacro-ischiatic notches, because they occur between the sacrum and ossa ischia.

From the foregoing it appears, that we assign to the pelvis an inferior strait, an excavation, and a superior strait, all of which are comprehended in the term lesser or lower basin; while on all that portion of the organ which

is found above the ileo-pubic line, is conferred the title of superior basin or upper pelvis.

The upper basin of the pelvis is bounded above, by the *cristæ* of the *ossa ilia*. The anterior extremity of this *crista* or rim, is called the anterior-superior spinous process, while a little below it, is observed the anterior-inferior spinous process. The *ilium* terminates, behind, in a posterior-superior spinous process, and has, a little lower down, a posterior-inferior spinous process. The bone exhibits an articular surface, placed in an oblique direction, near its hinder extremity; this surface is tipped with cartilage, that is in contact, in the recent subject, with a similar plate of cartilage upon the *sacrum*, at the point of their junction, the *sacro-iliac symphysis*.

The broad thin portion of the *ilium*, looking upwards and inwards, is the *costa*, or *iliac fossa*. It is in this concave part of the bone, that the child's head or other presenting part, is placed temporarily, whenever it becomes necessary to push that part away from the upper strait, in order that the *accoucheur's* hand may pass upwards into the womb, to seek for the child's feet, in turning. This seems to be one of its chief obstetrical uses; since the head can not be pushed backwards, because of the *vertebræ*, nor readily in front, on account of the resistance of the muscles; so, when the head rests on the strait, or within it, the *accoucheur's* hand, in order to pass upwards through the strait, must first of necessity remove the head into some other position. *Poupart's* ligament, which extends from the anterior-superior spinous process of the *ilium* to the *pubis*, also in some measure prevents the head from being pushed out of the way towards the left or right front, and is by some persons considered as composing part of the limits of the upper basin.

In order to get a good idea of the plane of the superior strait, let a half sheet of paper be cut in such a manner as to fit within the *linea ileo-pectinea*, and when placed therein, it will represent that plane. Hold the pelvis in

such an attitude as it occupies in an individual standing up or sitting, and it will be found that the plane of the strait dips at about thirty-five degrees, an inclination which is increased or diminished, at will, by extending or flexing the lumbar vertebræ.

In the practice of midwifery, it is often a matter of great importance to attend to the degree of inclination of this plane. Let us suppose a child lying within the uterus, and destined to pass downwards through the pelvis: if the plane of the superior strait be excessively inclined, the presenting part of the child would be propelled upon the top of the pubis, or even over and above it—a case that is not unfrequently met with; whereas, if the inclination be just or natural, the presenting part enters the opening without such impediment. To a practitioner unacquainted with the indications derived from the state of inclination of this plane, much embarrassment is likely to accrue, as long as he remains ignorant of the reason which prevents the engagement, as it is called, of the head from taking place.

If a piece of paper be fitted into the lower strait in like manner with that above mentioned, it will represent the plane of the inferior strait: upon comparing them, they are found to be very much inclined towards each other, being distant from each other one inch and a half in the front of the excavation, and five inches and a half behind.

If a piece of wire be now passed perpendicularly through the centre of the piece of paper that represents the plane of the superior strait, it will represent the axis of that strait. And if another wire be pushed through the centre of the plane of the inferior strait, and perpendicularly to it, it will be the axis of the inferior strait. The upper wire will strike the sacrum pretty low down, or towards its point; and the lower wire will strike the same curve pretty high up towards its base; all of which shows, conclusively, that the axis of the superior is different from the axis of the inferior strait, or what comes to the same thing, that the canal of the pelvis is a

curved one, and that the child in passing out must proceed through a curved, and not a straight canal. If the upper wire were bent, and pushed through the upper plane, and carried downwards until it passed through the centre of lower plane, it might then represent a curved axis of the curved canal; it would be the axis of the excavation.

If the reader will now take into his hand a sacrum, he will see that it is a triangular bone, with the apex downwards, and the base upwards. At the base is an articular surface, by which it was joined to the last lumbar vertebra; and on each side is an articular surface, by which it was united to the innominata, as before mentioned: these facettes are so placed that, it will be at once evident, the sacrum could not be driven downwards without riving open the innominata, for it enters them like a wedge; nor could it be driven outwards without also riving them asunder; so that it is in a manner dovetailed into the coxalia; a very wise provision of nature; for, all the forces that naturally operate on it, tend to drive the sacrum either downwards or outwards; as, first, the weight of the body, and second, the pressure of the fœtus during the parturient throes. These are the only forces to whose displacing action it is much exposed.

The sacrum is about four inches long, and when the coccyx is added, the whole length is at least five inches. If a ruler be placed so that it may touch the top of the sacrum and the point of the coccyx at the same time, it will represent the chord of an arch, the arch being formed by the curve of the sacrum, the deepest part of which curve will be found about midway between, but rather nearer the top than the bottom, and at least half an inch in depth, in an average of cases, notwithstanding that some specimens are found, in which the curve is either much greater or much less. All deviations from the average measurement exert a more or less unfavourable influence upon the progress of a labour.

Upon each side of the hollow of the sacrum may be observed a row of holes, which transmit nerves from the

lower end of the medulla spinalis. They are generally five in number upon each side. The situation of these nerves exposes them to severe pressure during the transit of the child's head over their foramina; and, as in other cases of pressure upon a nerve, the parts to which they are distributed, become affected with severe cramp or numbness, which generally vanishes as soon as the pressure ceases, but, not unfrequently, continues long after the termination of the labour, in consequence, perhaps, of the nerve having been severely contused and injured.

The coccyx is attached to the apex of the sacrum by a joint, which is said to admit of the point of the bone moving back half an inch when pressed by the foetal head. I think, however true it may be that the coccyx moves backwards when hard pressed, that this does not occur as a common or ordinary event. This seems to be established upon a reference to the situation of the sacro-sciatic ligaments, which fasten the coccyx so firmly to the os ischium that it requires a severe strain to move it backwards as far as is pretended. I have had several occasions to observe, that where the coccyx has been violently pressed backwards in labour, great pain and inconvenience have resulted from the accident, the symptoms being not very dissimilar from those which occur after falls upon the point of the bone.

The ossa ischia, whose situation has already been pointed out, merit the attention of the student of this important portion of obstetric anatomy, particularly as regards the appearance and influence of their inclined planes, of which so much is said in books of midwifery. The inner face of the ischium is nearly an equilateral triangle, and is three and a half inches in length; the surface is smooth and level, so that a ruler, laid upon it, touches it throughout. From the posterior side of the

triangle proceeds a strong process called the spinous process of the ischium, which furnishes a place of attachment for the lesser sacro-ischiatic ligament. The lower portion of the bone is rough and very thick, constituting the tuberosity of the ischium, the part upon which the body rests when in a sitting posture. A process springs upwards, forwards, and inwards from this point, to meet and unite with a like portion sent down from the pubis; it is the ramus of the ischium. The planes of the two opposite ischia incline towards each other forwards and downwards; in order to get a good idea of this inclination, let the student take a pair of compasses, and measure with them the transverse diameter of the superior strait, the legs resting upon the linea ileopectinea respectively. They will be found at least four and a half inches apart. But if they be now transferred to the transverse diameter of the lower strait, a leg of the compass resting upon the inner lip of each tuber ischii, they will be four inches apart; proving that the inclination of the planes causes them to approach at least half an inch in the course of their descent of three inches and a half from top to bottom of the sides of the pelvis. The posterior angles of the ischia are also much farther apart than their anterior. If two slender rods, eighteen inches long, be laid along the faces of the ischia, one on each, in a dried pelvis, and the lower ends of the rods be allowed to project below, they will cross each other about thirteen inches below the outlet. The effects produced by this arrangement of the inclined planes will be discussed in a subsequent page.

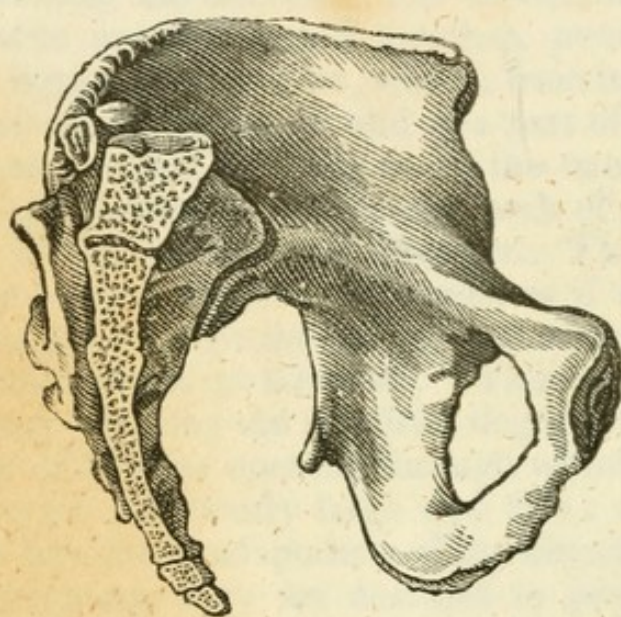
But while the surface of the ischium is level, that of the sacrum is very much curved, being farther from the pubis, by at least half an inch, at its middle, than at either its base or apex, a circumstance of the utmost importance in what is called the mechanism of labour. It is this curve of the sacrum, that gives to the lesser basin its specific character as "excavation." If the sacrum were straight, as the ischia are, there could be no excavation, the canal would be conical; a glance at the pelvis, or the figures, shows this conclusively.

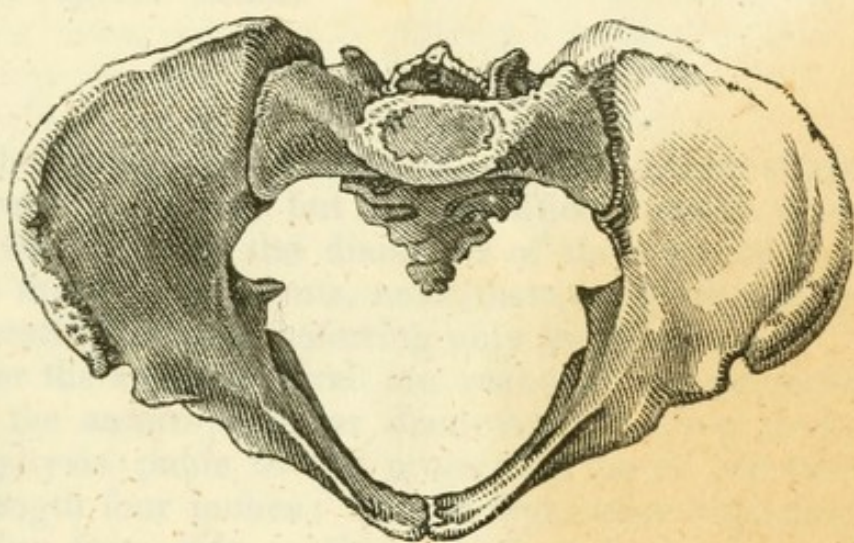
It should now be observed, that the pubis sends off an horizontal portion to unite with the ilium and ischium in the acetabulum, and a descending ramus to meet the ascending ramus of the ischium, which it meets half way. These horizontal and descending portions leave an oval opening called the foramen ovale, which, in the recent pelvis, is filled with a membranous ligament called the obturator membrane, giving origin to muscles, and passage to vessels and nerves. The descending rami of the ossa pubis are connected together, towards their origin, by a ligamentous matter, which, from its shape, is called the triangular ligament, and is a part of the inter-pubic ligament, which not only binds the two pubes together, but also serves to render the arch of the pubis broader or lower, as well as stronger. The anterior edges of the rami are turned outwards, as if some hard body had passed through the pelvis, and squeezed them out, while in a soft and plastic state. This conformation admits of their retaining the requisite degree of strength, while it also allows the opening through which the child is to pass, to be sufficiently large and free; a singular proof of the wonderful adaptation of the organs, in early life, to the functions they are destined to perform at a more advanced period of existence.

The sacro-sciatic notch is partly occupied by two ligaments: one proceeding from the edge of the sacrum to the tuberosity of the ischium; and the other from the edge of the sacrum, and coccyx, to the spine of the ischium; the former is the outermost one. Hence it is seen, that the lower strait of the pelvis, in the recent subject, is marked by the point of the coccyx, the inner edges of the tuberosities and rami of the ischia, the inner edges of the arch of the pubis, and the inner edges of the sacro-sciatic ligaments.

From all the foregoing, the student cannot fail to have









acquired an idea of the planes of the pelvic straits; the inclined planes of the ischia; the superior strait; the inferior strait; and the great space between them, called properly the *excavation*. He will see, therefore, that the child's head may be engaged in the superior strait; it may be entirely in the excavation; or again, it may be engaged in the inferior strait; and that the processes he should institute in conducting a labour, will be modified by its situation with regard to these several points. *The figure exhibits the curve of the sacrum, the plane of the ischium, and the inclination of the plane of the superior strait.*



The diameters of the pelvis are certain lines supposed to cross its *straits*; but the practitioner ought to be not less familiar with the diameters of the excavation, than with those of the straits, notwithstanding we commonly understand them as referring only to the straits.

For the superior strait are reckoned four diameters: 1st, the antero-posterior diameter, extending from the symphysis pubis to the projecting top of the sacrum, in length four inches; 2d, the transverse diameter, extending from side to side, which is four and a half or five inches; and 3d and 4th, the two oblique diameters, extending from the sacro-iliac symphysis on either side, to the ileo-pubal line, opposite to the acetabula. They are each five inches; but in the recent subject, the transverse diameter is lessened because of the psoæ and iliac muscles, which overhang the sides of the brim. *See the cut, which represents the opening, or superior strait.*

In regard to these diameters, it is proper to be understood, that they are the average results of the measurement of many pelves, and cannot be taken as the invariable dimensions of the female pelvis; for all are not alike, some being as much as five inches in their antero-posterior line, and others less than four inches. Let it be understood, therefore, that a well-formed pelvis has such dimensions as have been above assigned.

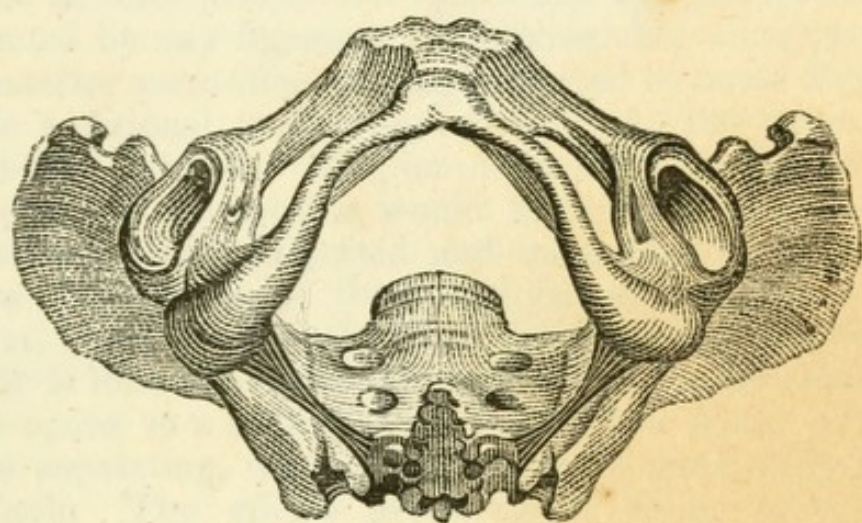
To the inferior strait, only two diameters are com-

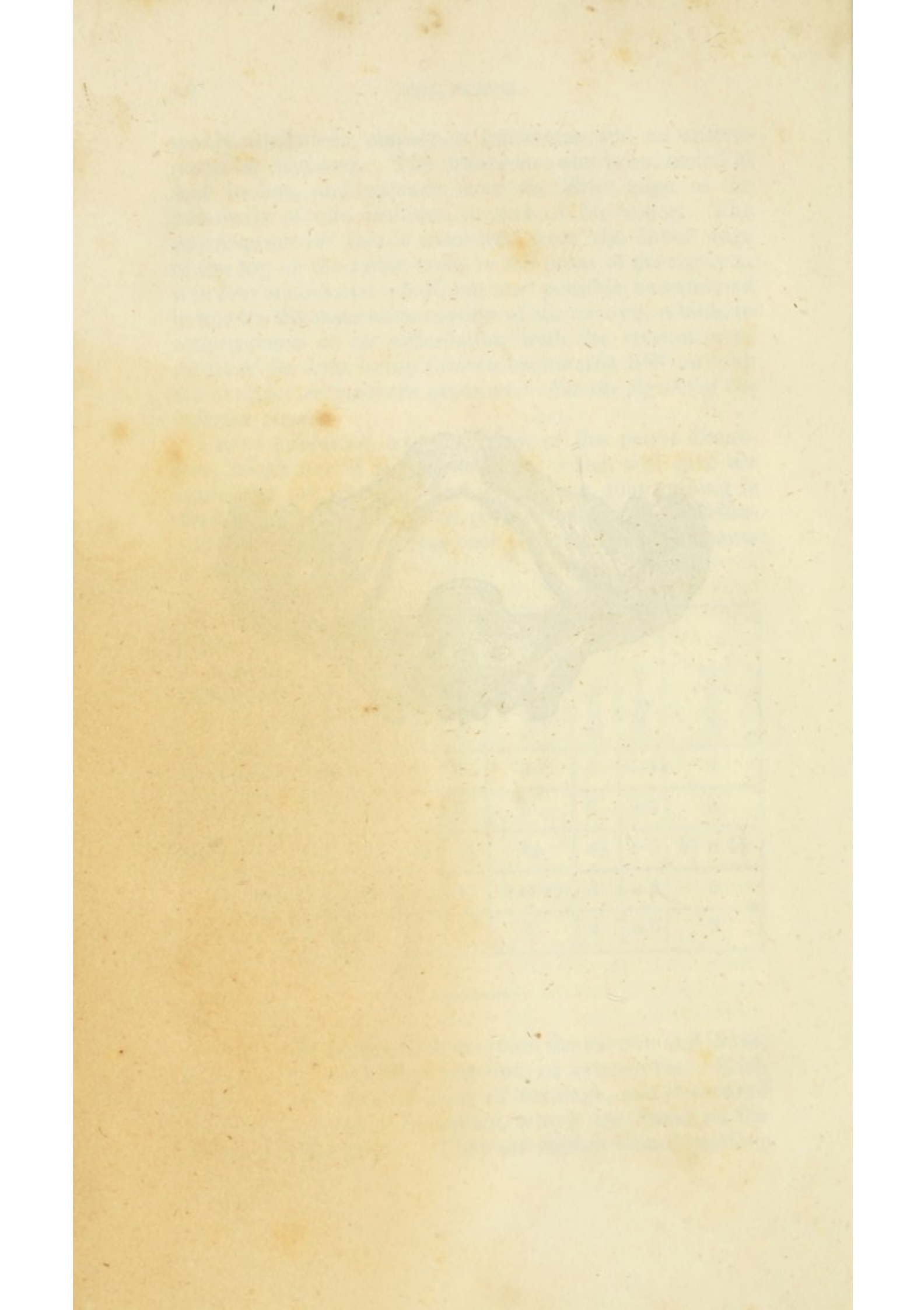
monly attributed: namely, a transverse and an antero-posterior diameter. The transverse one is estimated at four inches, and extends from the inner edge of the tuberosity of one ischium, to that of the other. The antero-posterior one is measured from the inner edge of the top of the pubic arch, to the point of the coccyx; it is four inches and a half, but may possibly be rendered larger by the regressive motion of the coccyx, which, in consequence of its articulation with the sacrum, may admit of its apex being thrown backwards half an inch when under very severe pressure. *See the figure of the inferior strait.*

I have subjoined a tabular view of the pelvic diameters, taken out of several authors, which will give the reader the advantage of seeing, at once, that nothing is absolutely settled upon this point, since so many distinguished writers differ from each other in their statements of them.

PELVIC DIAMETERS.	Smellie.	Burns.	Baudelocque.	Gardien.	Capuron.	Boivin.	Dewees.	Ashwell.
A. posterior	$4\frac{1}{2}$	4	4	4	4	4	+ 4	4
Transverse	$5\frac{1}{4}$	$5\frac{1}{4}$	5	5	5	5	+ 5	5
Oblique	0	$5\frac{1}{8}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	+ 5	$5\frac{1}{8}$ to $5\frac{1}{4}$
Coccy-pubic	5	5	4	4	4 to $4\frac{3}{4}$	4	+ 4	5
Ischiatic	$4\frac{1}{4}$	4	4	4	4	4	= 5	4

The articulation which conjoins the sacrum and ilium, is called the sacro-iliac junction, or symphysis. Each of the bones has a covering of cartilage, and is secured by certain powerful ligaments, which are found on the exterior of the pelvis. They are further bound together





by the sacro-sciatic ligaments before mentioned, two in number; namely, an outer or greater sacro-sciatic ligament, passing from the inferior and posterior portion of the ilium and the edge of the sacrum and coccyx, to the tuber ischii; and an inner or lesser sacro-sciatic ligament, arising from the edge of the coccyx and sacrum, and inserted into the spine of the ischium. The lines of these fibrous bands cross each other obliquely, but are in a measure fused by fibres which pass from each to the other, interchangeably. They are very strong, and add much to the security of the articulation.

The anterior part of the sacro-iliac symphysis is not protected by any ligament of considerable size, except the anterior sacro-iliac, although covered by some fibrous bands additional to the periosteum. As the principal sacro-iliac ligaments are placed on the outer margin of the joint, the symphysis would be liable to open, were it not completely subjected and controlled by the ligaments which compose the symphysis of the pubis; and in fact, when the symphysis of the pubis is ruptured or cut, it is found that the sacro-iliac symphysis immediately opens to a considerable extent, the bones of the pubis separating, without any artificial force, fully half an inch. The effects produced by riving open the sacro-iliac joint may be readily conceived of. They are pain, inflammation; and, if not fortunately cured, the ultimate consequences are hectic fever, and death, from caries.

The symphysis pubis is formed of a fibro-cartilage; passing across from one bone to the other, and so strong, as to admit rather of the disruption of the bone, than that of its own tissue. The inferior edge of this ligament constitutes the crown of the pubic arch; and as it has a triangular shape, it is properly called the triangular ligament of the pubis. In the centre of the inter-pubic ligament is found a small synovial cavity.

An opinion prevails pretty extensively among the common people, that the joints of the pelvis are so constituted, as to yield during labour, in order to admit of the escape of the child, which is thought to be always too large for the canal, unless it be previously dilated by this

supposed method. It is only necessary to study the relations of the child's head to the pelvis, in order to perceive that no such opening of the symphysis is necessary in ordinary cases of parturition. But, in examples of labour wherein a disproportion does exist, either from the excessive size of the child absolutely, or from a malposition bringing incompatible diameters into relation, no doubt can be entertained, that these joints may be forced, and often are; or that the consequences of such strain will depend upon its degree, the state of the constitution, and, in some measure, on the plan adopted for its treatment. Certainly, many of those females who complain of lumbagos and sciaticas supervening upon severe labour, should be suspected, at least, of some injury suffered in these articulations.

CHAPTER II.

THE CHILD'S HEAD.

THE study of the form and dimensions of the pelvis, derives its chief importance from the relation existing between its proportions and those of the child's head. This therefore will be the proper place to speak of the foetal head, and to show how its form and dimensions come to bear upon the measurements which we have assigned as the average dimension of the pelvic passages.

The bones of the foetal head are not firmly united; they may even be entirely separated from each other by maceration in water; and, in the living child, they are so loosely bound together, that they may be made to move by a very moderate degree of pressure.

The mobility of the cranial bones admits of a lengthening or shortening of the several diameters of the skull, under the forcible pressure to which it is subjected during its transit through the passages; but we are to estimate these diameters as they exist when not under pressure, and we find that they present an average, which will now be stated.

The diameters of the foetal head are: 1st, the oblique, which extends from the symphysis of the chin to the vertex or point of the head, in length five inches; 2d, the longitudinal or horizontal, which extends from the space between the eyebrows to the vertex, in length four inches; 3d, the transverse, which passes through the

skull from one parietal protuberance to the other, three inches and a half; and 4th, the perpendicular, which reaches from the top of the skull to its base, also three inches and a half.

The head is of an oval shape, and if held in the hand will at once be seen to be largest at its occipital extremity, so that if the vertex present, the largest end of the head will of course descend first, and its smallest circumference, equal to ten and a half inches, will be nearly parallel to the successive planes of the canal. Let it now be observed that the foramen magnum of the occipital bone is on one side of the oval, and that it is there articulated with the neck; and it will be seen, that if the vertex descends foremost, the chin must be pressed down towards the front of the throat, whereas if the face presents first, the occiput must be thrown back so as to be pressed against the back of the neck or betwixt the shoulders; so that if the head advances either with the vertex first, or the face first, its smallest diameters or circumferences will be in accord or parallelism with those of the maternal pelvis, that is, its oblique diameter will be parallel or nearly so to the axis of the pelvis. Hence we find that a child may be born very well either face foremost or vertex foremost; and indeed, some of the French writers assert, that in face presentations there is very little more, or perhaps not more difficulty than in those of the vertex—a most important fact if it be true, inasmuch as the face presentations have been heretofore regarded as indicative of the very serious operation of turning. We have seen a child, which at birth weighed eleven pounds avoirdupois, born face foremost with very little more effort or pain than would have accompanied its birth had it presented by the vertex, and that too in a first labour; we have also seen face cases which absolutely required the aid of the forceps, and even that of the crotchet, and in which the children would probably have been naturally delivered had the vertex presented. But we must remit this topic to its proper place in this work.

From the incompleteness of the ossification of the foetal cranium, there are left in it certain spaces which are not occupied by bone, and these are easily distinguished

by their soft or elastic feel under the finger. They are called the moulds or openings of the head, and are technically denominated the Fontanels. There are two principal fontanels, the anterior and the posterior. The former at the anterior and upper angles of the ossa parietalia, and the latter at the posterior and upper angles.

The student is aware, that in the early stages of the fœtal growth, the suture called sagittal, extends from the nose backwards to the occipital bone, and that the coronal crosses the sagittal, from one temporal bone to the other. The anterior fontanel, therefore, will have four suture lines passing from it; and it is often an inch long and half an inch in width, so that when touched by the finger high up within the pelvis, the mere size of the membranous space, as yet unossified, ought to serve as a sufficient means of discriminating between it, and the posterior or occipital fontanel. But the latter, known by its smallness, may be also well known by the circumstance that it has only three suture lines running out from it; namely, the sagittal, which proceeds forwards, and the two legs of the lambdoidal, which extend downwards and backwards; for the sagittal suture stops at the top of the occipital bone, except in a few very rare instances in which it is observed to pass downwards, dividing the occipital bone into two equal portions, a case which might very well mislead an incautious practitioner. The posterior fontanel is very small, and is generally so small, that it can only be known by the circumstance of its having but three suture lines proceeding from it like radii. As the ossification of the bone is more complete here than at the part where the anterior fontanel is situated, the practitioner can often determine which fontanel he touches by the hardness and roughness of the suture edges on which his finger rests.

In many cases, the head, previously to the birth of the child, acquires a great degree of firmness. It is proper to remark, that in difficult labours, a very firm ossification of the bones of the cranium is a cause of increased difficulty, on account of their inaptitude to yield, and thus permit the volume of the cranium to be diminished under the pressure.

CHAPTER III.

THE DEFORMED PELVIS.

NOTWITHSTANDING a wise Providence has so happily constituted the relative dimensions of the fœtal head, and the maternal pelvis, that the parturient female is, in the vast majority of cases, enabled to bring forth her offspring without any preternatural effort or suffering, it unfortunately happens that this just proportion does not always exist, and that, in consequence of disease, the pelvis may be smaller, or the head may be larger, than they ought respectively to be.

Many writers speak of a deformity of the pelvis, which consists simply in an excessive amplitude of the whole of its canal, and great evils are supposed to result from this species of deformity. I question much whether deformity is a proper term for a conformation, which could only have the effect of rendering the birth of the child more facile and rapid; nevertheless, as several inconveniences are found to arise from such a conformation, they shall be briefly mentioned and explained before we proceed to treat of deformed pelvis, more properly so called.

At the fifth month of pregnancy the womb has become so large that it rises out of the cavity of the pelvis, and is then supported upon the top of the pubes, so that the woman is from that time relieved from the incommodity which she would experience should the lower end of the uterus continue to occupy the excavation; but, if the

pelvis be possessed of an excessive amplitude, the womb does not rise up as it ought to do; the female continues to experience, throughout the uterogestation, the symptoms of a prolapsus of that organ, the lower end of the womb sinking down towards the perineal strait, and incommoding both the rectum and bladder by its pressure, and producing that uneasy sense of dragging weight, and pain about the loins, which are characteristic marks of prolapsus uteri.

When labour comes on in a woman with a very ample pelvis, her throes have the effect of urging the whole body of the uterus down towards the perineal outlet, and hence, before the mouth of the womb is fully dilated, the head of the child, still partially enveloped in the undilated womb, may be pushed through the vulva. On the other hand, if the orifice of the womb should yield readily, the head, finding little resistance from the capacious bones of the pelvis, is liable to be very suddenly expelled, and the womb, surprised, as it were, by the sudden evacuation of its cavity, falls into a state of atony, the consequence of which might be either hemorrhage, or inversion of the organ. These are the inconveniences resulting from deformity from excessive amplitude. The reader will see that most of them may be readily obviated by a careful practitioner, and that they possess a greater apparent, than real importance or magnitude. Not so with deformity from want of amplitude.

Inasmuch as the bony frame of one individual may differ from that of another, in respect to size and form, some being very large and others very small, as the head of one woman is smaller than that of another, it is evident that the pelvis may be smaller in one than in another. A woman shall have a pelvis, which, to all appearance, is perfectly well formed, all its parts bearing a due proportion to each other, whereas, when it comes to be measured, it is found to be of an under size. Such a female would experience far greater difficulty in giving birth to her child than she would if her pelvis had been of a full size, and the difficulty would be just in proportion to the departure from the average or standard size.

Such a pelvis will perhaps never be found to give rise to insuperable difficulties ; it will only render the labour slow and vexatious, and perhaps exhausting. But the truly deformed pelvis, that in which the proportion between the several parts is altered or destroyed, is not unfrequently met with, giving occasion to the greatest embarrassment to the practitioner, and subjecting the mother to the most dreadful sufferings, danger, and even inevitable death itself.

This kind of deformity may have taken its rise in childhood, or may have been produced after the woman had attained to adult age. In the former case it is commonly the result of rickets, in the latter of malacosteon.

In both these diseases the solid phosphate of the bones is absorbed, to such a degree, as to permit them to yield to pressure, so that, if the subject be greatly affected with the disease, the long bones, as the ossa femoris, the tibia, the ossa humeri, &c. assume an arcuated appearance, which probably results from the continued action of the muscles, tending naturally to bend or curve them. Thus, the femur is found to be arched by the perpetual action of the strong flexors of the leg, which have this advantage over the extensors, in this case, viz. that the femur is naturally somewhat curved in the same direction which the action of the flexors tends to give it.

If the deprivation of phosphate of lime should extend to the bones of the pelvis, in any case of rickets, a change in the form of that part will result from the superincumbent weight of the body, both in the act of sitting, and standing. If the patient be often or long in a standing posture, the whole weight of that part of the individual which rests on the vertebral surface of the sacrum, tends to crush the sacrum downwards towards the ossa pubis, because the pressure is opposed by the acetabular portion of the pelvis, resting as it does upon, and resisted by the ossa femoris. Under these two opposing forces, the thin flattened parts of the ossa ilia, which form the top of the sacro-sciatic notches or arches, yield, and allow the upper edge of the sacrum, called its promontory, to descend towards the pubis, and thus occupy the superior strait, more or less completely, according to the

extent of the diseased softening of the bones. When the patient recovers her health, she recovers with a permanent distortion of the pelvis. The new calcareous deposit takes place in the bone, already modified in shape, and thereby renders the distortion incurable.

The varieties of form assumed by the pelvis, under this strange disease, are very great, yet an attempt has been made to arrange all the deformities under certain specific characters, for which the reader may consult Madame Boivin's Memorial, or Velpeau's Elements. I do not clearly perceive the advantage derivable from a learned nomenclature of these unfortunate deviations of structure. They must ever vary, according to a multitude of contingencies in the locality, or degree of the malady, so as to defy every attempt at classification.

It sometimes happens, that, instead of the promontory advancing into the centre of the strait, the pubes are found to retreat towards the sacrum; or, one side of the pelvis is exceedingly narrowed; or, the horizontal rami of the pubis approach each other, so as to become nearly parallel, and thus jut out, like a tongue, in front.

In some cases the superior strait is scarcely changed at all, while the tuberosities of the ischia approach very near to each other, carrying along with them the sides of the pubic arch, and thus rendering the outlet of the pelvis wholly impassable for the child, and even for the hand of the accoucheur.*

The sacrum may become excessively curved, its apex rising up towards the arch of the pubis, so as to occupy part of the perineal strait.

The effect of these various modifications of form can easily be conceived of by the student, who reflects that the child's head is of an ascertained diameter, which requires a corresponding magnitude of the bony passages

* I have seen such a pelvis in the University of Pennsylvania. It was the pelvis of a woman who died undelivered, a few years ago, in the Philadelphia Alms House, after firmly rejecting the relief that was proposed to her, by means of the Cæsarian operation. To introduce the hand into the region of the upper strait is impossible, even in the dried pelvis.

through which it is destined to make its escape from the maternal organs.

In addition to the distortions arising from rickets and malacosteon, the female pelvis is liable to be obstructed by exostoses, which may become so large as to prevent the exercise of the parturient function. Thus, Madame Boivin gives a drawing of one which grew from the left sacro-iliac symphysis; and Dr Dewees tells of a specimen which sprung from the anterior part of the ileo-pectineal line, and occasioned the death of the lady, whose womb was ruptured from its pressure on the sharp process of diseased bone.

The spinous processes of the ischia also may receive, either originally or adventitiously, an unfavourable inclination inwards, so as to encroach upon the space destined for the passage of the head, which is sometimes arrested by this spine, or very severely contused during its transit over it.

Many interesting considerations, arising out of a view of the deformities of the pelvis, may be very properly deferred until we come to speak of those difficult or impracticable labours, of which they are the principal causes, and along with which they may be better explained.

CHAPTER IV.

THE ORGANS OF GENERATION.

THE organs of generation are divided into external and internal, the latter term being applied to those which are contained within the cavity of the pelvis, and the former referring to those that appear upon the external surface of the pelvis.

The external sexual organs, in the aggregate, are indicated by the word *Pudendum*; a word very happily selected as a reference to, rather than a direct denomination of, a part of the body which the sex, without exception even of many barbarous tribes, endeavour modestly to conceal. We are told that the first sinful indulgence of the human appetites, was succeeded by the deepest consciousness of exposure upon this subject, and the fig-leaf, which concealed the shame of the first woman, is a simple expression or emblem of female delicacy. The *Venus de Medici* is not less expressive of female modesty, than of the perfection of the female form: its modesty is the key to that inimitable, universal and pervading beauty, which places it at the head of the ancient works of art, and renders the statue at once a truth in morals, and a high compliment to the sex.

Notwithstanding the aversion of females to every allusion to the pathological or obstetric affections of these

organs, it is unavoidably incumbent on the practitioner to make himself acquainted with their anatomical structure, since they are the seats of diseases and accidents, and the agents of processes which the practitioner is often called upon to superintend; and it would be the grossest injustice to the female patient, to assume the conduct of some of her sexual disorders, without a perfect preparation for the discharge of duties which, by their importance, necessarily take precedence of considerations that, under other circumstances, it would be both wicked and disgusting to premit. Let the student of midwifery, therefore, experience no sentiment at variance with the *mens sibi conscia recti*, in turning his attention to this portion of our subject.

The surface of the body which is found in front of, and just above the symphysis of the pubis, is raised so as to present the appearance of a protuberance, which, at the period of puberty, is covered abundantly with hair, and has received the denomination of Mons Veneris. The cutis which covers this part is supplied with numerous sebaceous follicles, and is ordinarily of a darker colour than the general superficies. The size of the protuberance varies in different individuals, being greatest in those who are fat, and almost disappearing in those who are much emaciated. The subcutaneous structure is largely supplied with an adipose deposit, contained in cells, connected by so dense a tissue, that inflammations and abscesses occurring within it, are rendered remarkably painful, as is the case in all such affections occurring in unyielding textures.

A little below the top of the pubic symphysis commences the genital fissure, which is most commonly designated by the term Vulva. The parts which are separated by this fissure are called the Labia Pudendi, or Labia Majora. They are composed of skin, which

is divided at the inferior part of the mons, in order to admit of this construction, the division extending downwards to the lower extremity of the vulva, where it terminates in the inferior commissure of the vulva, or anterior edge of the perineum. The labia, which externally consist of cutis, in all respects similar to that of the mons, and like it covered with hair, are internally lined with an epithelion, that serves to protect the mucous surface beneath. The basis of their structure is a rather loose cellular tela, supplied less abundantly than the part above with adipose cells, and therefore liable, during inflammation, to a great degree of swelling. The labia also, since they serve as the outer limits of the vulva, are liable to a great degree of elongation, or distension, during the transit of the child in parturition. This distension is so great that it equals a circle of about ten inches in circumference. As the superior commissure of the vulva is found at least one inch above the bottom of the symphysis pubis, and the foetal head passes out between the top of the pubic arch and the inferior commissure of the vulva, the student will appreciate the very great extensibility of the labia majora; nor will he experience any surprise upon being informed that a very great degree of force is required to overcome their resistance; that much time is often consumed for that end; or that the labia are occasionally ruptured before they become sufficiently extended to admit of the escape of the head. I have seen one instance in which the left labium was broken transversely during the transit of the head in a first labour. No evil consequences ensued in that instance, the wound uniting by the first intention.

When the labia are put excessively upon the stretch, it occasionally happens that some of the blood vessels, with which they are abundantly supplied internally, give way, and a quantity of blood is poured out into the cellular tissue within. The extravasation may amount to only a teaspoonful, or may equal half a pound. Of course, in such a case, the organ must be greatly swollen, and of a dark colour, causing very severe pain, or sloughing of the part. The swelling is generally discovered soon after the conclusion of the labour. The blood may

be removed by making a free incision, to be practised upon the internal surface of the labium, which indeed will be most easy to come at, because, in extensive swellings of this part, there is always eversion of the labium, and not inversion, in consequence of the greater density of the cutis. The same thing is observed in swellings of the lips, which seem to be then everted; so also in swellings of the eyelids, where some degree of ectropium is a common result of great distension.

Pregnant women are frequently afflicted with œdema of the lower extremities. The swelling, in some examples, extends up along the thighs, and the watery infiltration causes a very great swelling of the labia, as soon as the infiltration reaches them. I have seen a case in which, notwithstanding that I punctured the labia repeatedly, antecedently to the approach of labour, so as to permit the serum to escape, the labia and perineum were so swollen and hard, as to produce the highest degree of embarrassment during the parturient efforts. Where the swelling is great, several punctures with a lancet should be made, towards the close of pregnancy, in order to permit the fluid to escape. A lesser degree of tumefaction does not demand so unpleasant a remedy, the water of the cellular tissue being pressed out by the advancing head, and dispersed into other portions of the cellular texture in the vicinity of the vulva.

The labia, occasionally, are the seats of abscesses that are excessively painful. They point towards the inner surface, for the most part. They suppurate rapidly, and should be opened as soon as a deposit of pus can be ascertained to exist. Few cases will probably be found in which the medical attendant shall be able to discuss such inflammation, since their location deters the female from calling for his aid, until intolerable pain or inconvenience compel her to do so; and at such a stage, suppuration will, for the most part, be found inevitable.

Whenever it is deemed practicable to effect a resolution of such inflammation, it ought to be attempted; since we know not what change of structure may take place, in consequence of abscesses in the labia. Whatever causes tend to affect the labia with permanent alter-

ations of their form or density, are to be always carefully obviated, since the part they perform in labour is highly important. A bleeding from the arm, followed by leeches to the part, and fomentations with decoction of linseed, saturnine applications, &c., will be proper, upon the institution of an attempt to discuss an abscess in the labium.

In young children it not unfrequently happens that the inner face of the labia pudendi becomes irritated, which results in adhesive inflammation, uniting the surfaces that are in mutual contact. The frequent evacuation of the bladder, of course, will always prevent a union of the whole extent of the labia.

In all the cases of this kind that have fallen under my notice, I have found it sufficient to separate the united surfaces by drawing them apart with the fore and middle finger of the left hand, while, with the end of a probe, drawn down directly upon the line of union, the adhesions are easily destroyed, and that without occasioning the least bleeding. The scalpel has never been required. I have no doubt, however, that a case may occur, in which, by long neglect, the union should acquire so great a degree of solidity as to yield only to the knife.

When the labia shall have been separated, in these instances of cohesion, they should be carefully kept from coming into contact, by a pledget covered with cerate, as the adhesive tendency is renewed by the very violence which is required to obviate the consequences of a preceding irritation.

The appearances presented by the labia in virgins, are different from those occurring in females who have borne children. In the latter they present a somewhat shrivelled or collapsed appearance, except in fat persons; and the inner surface, which in virgins is of a rose tint, becomes bluish in the aged, or those who have had children. The inferior commissure, also, is lower down in women who have borne children; whereas, in the virgin state, the lower commissure crosses the pubis almost as high up as the top of the triangular ligament. This is found to occur in most young females, examined early, in a first labour.

The Nymphæ are also called labia—labia minora, labia interna. They differ from the greater labia in that they consist of a duplicature of the mucous membrane, covered with a strong epithelion, and containing an erectile tissue; whereas the greater labia have a basis of adipose texture, possessing no erectile structure. In young persons the nymphæ are wholly concealed within the genital fissure; but in those who are somewhat advanced in age, and who have borne children, one of them may be commonly observed to protrude beyond the vulva, a circumstance which depends much more upon a change of its proper structure, than upon the shrinking of the labia consequent upon advancing age and repeated parturition, as has been already mentioned. The top of the nymphæ is but little below the superior commissure of the vulva, and each nymphæ descends obliquely outwards, terminating rather more than half way down the labium of each side. This arrangement gives it the appearance of a pointed arch.

The colour of the nymphæ, in young persons, is a lively red, and their surface is not corrugated; whereas in women who have borne children, they assume a darker hue, and are sometimes very much corrugated, not unfrequently presenting a lobulated appearance. Haller informs us that hairs are occasionally found to grow upon them. They are abundantly supplied with a peculiar kind of sebaceous matter, which, in uncleanly individuals, accumulates in considerable quantities, giving rise to a disgusting fœtor.

It is useless to inquire into the motives for bestowing upon this organ a title which appertains to the divinities that preside over fountains. It is at least certain that these bodies exercise no influence over the sources or direction of the urine. It is asserted that they subserve a very important end, to wit, the supply of an additional material for the distensions which these parts undergo in the last moments of labour, thus diminishing the risk of rupture of the external parts of generation. I have,

however, repeatedly ascertained, that at the instant of the extremest distension of the vulva, the nymphæ are not effaced, but can be distinctly felt, like a firm ridge, little less elevated or marked than in the most entire repose of the organs. It is easy to verify this fact in any case of labour.

There is high authority for the assertion that they are the subjects of erection under the excitements of the sexual passion, and possibly they may concur, therefore, in the production of the orgasm which seems essential to conception. It is proper to say, however, that the uses of the nymphæ are unknown. They do not exist in any other species of mammalia, agreeably to the declaration of Mr Lawrence, in his notes to Blumenbach's Comparative Anatomy.

Notwithstanding that the fold of the nymphæ is not effaced or flattened out in labour, it sometimes happens, that while contingently elongated by the extension of the labia, they suffer lacerations. Like all other living tissues, they are obnoxious to inflammatory diseases, which are often extremely painful. The treatment of abscesses of these parts is conducted upon the same principles and indications as occur in those of the labia majora.

In those individuals in whom they protrude beyond the external surface of the vulva, excoriations of them are occasionally met with. Where such excoriations are rebellious under treatment, it is best to remove the protruding portion by the scalpel or scissors. This operation may be safely resorted to, since it is a prevalent custom among many tribes of Arabs and Moors, and also the Coptic inhabitants of Egypt, to apply the rite of circumcision, or rather excision, to the young female.

It can not be needful, in a work so limited as this, to enter into investigations concerning the so much talked of *tablier des Hottentotes*. For an ample account of the subject I refer the curious student to Mr Lawrence's Phys. and Zool. of Man, page 420, where a very sufficient number of authorities may be found. M. Merat's remarks on the same subject may also be examined, sub voce, in the Dict. des Sc. Med.

The tip of the Clitoris juts out under the summit of the pointed arch formed by the nymphæ. The clitoris possesses very considerable analogy to the male penis: it consists of two corpora cavernosa, possessing two crura, which, like the crura of the male penis, are attached to the ossa pubis; and the analogy may be further prosecuted, by attending to the manner in which the deep crescentic fold of the upper part of the nymphæ surrounds the apex of this organ. This fold is called the preputium clitoridis. The clitoris differs from the male penis in that it possesses no corpus spongiosum, and of course it can have no real glans, or urethral canal. It is erectile, and is endowed with the most intense erotic sensibility. The uses of the organ are probably to be sought in this peculiar endowment. Its universal occurrence in the mammalia bespeaks its importance. We are assured by Blumenbach, in his Comparative Anatomy, that the only animal belonging to this class in which it is wanting, is the *Ornithorhynchus* of New Holland, and that animal is truly denominated paradoxus.

The clitoris is the subject, in some individuals, of so great a degree of hypertrophia, that it comes to bear a marked resemblance to the male organ. Such affections, doubtless, are the causes of a prevalent vulgar belief in the existence of hermaphrodites. The cases of monœcious vegetables and of some zoophytes, as the earth worm and other inferior creations, may be cited as examples of the double sex in an individual constitution. The Indian corn, for example, fecundates by its male organ its own female germ. But notwithstanding that monœcious plants, and some of the lower orders of the animal kingdom, contain within their bodies the organs of a double sex, we are not authorised to admit that a similar condition can occur in beings of a highly complex organization, where an entire individuality of the male and female are and must be indispensable. The prayer of Salmacis, that her lover's body and her own might be united into a single one, although granted by the mytho-

logical divinities, leaves the sexual individuality both of Salmacis and Hermaphroditus undestroyed; and so must it always be both in nature and imagination.

Wherever suspicions are entertained of the existence of an hermaphrodite, it will probably be found that an enlarged clitoris, or a bifid scrotum, presenting the appearance of labia pudendi, have given rise to the suspicion.

Just on a line with the top of the pubic arch, is a small bulbous projection, which encloses the orifice of the urethra: the triangular space included betwixt this bulb, the nymphæ and clitoris, is called the Vestibulum. It is important to understand its position, because it is always referred to in introducing the catheter, which is very easily performed with a correct knowledge of this part, and very difficult of execution in the absence of such knowledge. The lower part of the vestibulum is divided by a raised line or raphe, which can be readily felt with the point of the finger, and which leads directly to the orifice of the urethra, to which it should serve as a director in the operation above mentioned.

The female Urethra is from an inch and a half to two inches in length. It turns upwards and backwards directly under the triangular ligament of the pubis. In introducing the catheter, the point of the tube should be directed perpendicularly to the surface of the vestibulum, and introduced within the orifice of the urethra, and then, by depressing the handle, the point will turn upwards behind the bone towards the orifice of the bladder. Notwithstanding that the female urethra is so short, it often happens that the bladder, when very much distended with urine, and particularly during labour, is carried very high up, so that the urethra is elongated. I have been several times obliged to introduce the catheter fully four inches, before it would enter the bladder of

urine. The urethra is also very much elongated in some cases of retroversion of the womb.

On account of the situation of the urethra, it is sometimes subjected to so severe a degree of pressure by the foetal head, that it sloughs before or after delivery, and gives rise to the distressing symptoms of urethro-vaginal fistula. It is also subject to contusion and laceration in some of the forceps or crotchet operations; accidents that cannot be too carefully guarded against by every humane or considerate practitioner, as entailing upon the patient the most distressing stillicidium of urine.

Not very long since, in examining a female who complained of a constant flowing of urine, I passed three fingers, side by side, into what had once been the cavity of the bladder, but was now a blind sac, connected with the anterior part of the vagina. She informed me that she had been delivered with forceps, some weeks previously to my visit, after a lingering labour. I have very lately seen a young female with a fistula which seems to enter the vagina at its very top, where in contact with the neck of the womb. It is connected with the upper part of the urethra, and gives issue to a perpetual flow of urine.

The treatment of urinary fistula is very difficult. An essential condition in the cure, is the prevention of the stillicidium during the curative processes. Hence, a catheter of convenient length should be worn in order to permit the urine to escape by the course of the urethra, and not through the fistulous opening, which thus is permitted to contract, and ultimately to become closed. Where the opening is very small and callous, it is possible to conduct to it an actual cautery, guarded by a canula of proper dimensions. So severe a remedy, however, could only be resorted to after a patient trial of the efficacy of the catheter used as above mentioned.

The Hymen is a fold of the mucous membrane of the genital surface. It is a crescent, with the cornua directed forwards. It is situated just within the entrance of the

vagina; and is so thin and delicate as to yield to a slight force; whence it is often wanting in adult persons, having probably been ruptured during infancy or childhood. Certainly there are many very young subjects met with in the anatomical rooms, in which no trace of it is to be discovered. The fold of mucous membrane of which it is composed, is broad in some, and very narrow in others. I am well convinced that I have, in many instances, met with the unruptured hymen during my obstetric practice. I may venture to assert, that whoever attends a great many women in their first labour, will have occasion to observe the existence of a very narrow hymen in many such persons. I make this statement, not unaware that I may be charged with having mistaken the fourchette for the organ in question. I think, however, that my opportunities in midwifery practice for acquiring experience, have been so sufficiently ample, as to warrant me against the commission of so gross an error.

In some individuals, the hymen is not crescentic, but circular, with an opening in the centre, or in some other part of its plane; and a few examples are met with in which the hymen is imperforate.

Instances are also recorded of such firmness in the tissue, that incisions have been required in order to allow of the delivery of the fœtus, which was prevented from being delivered by the resistance of the hymen.

The foregoing should serve to convince the student, that as a test of virginity, this organ cannot be relied on, since it is often wholly wanting; so slightly developed as to oppose no resistance in coitu; and, even in labour, to require the aid of the surgeon for its destruction.

The barbarous practices of some of the African nations, and the distressing suspicions and doubts which sometimes are connected with the vulgar errors on this subject, ought, if possible, to be exploded. It appears to me to be the duty of the physician to speak in positive terms, and whenever suitable occasions offer, to reprobate so useless and often injurious a dogma.

A space that exists between the Fourchette, which is the inferior commissure of the labia, and the hymen, is called the Fossa navicularis. The fourchette is a pretty firm fold of the tissues, serving to unite the lower extremities of the vulva. It is said to be generally ruptured in a first labour, which I do not admit. It is doubtless often broken, and no evil consequences commonly ensue.

Although the term Perineum should in strictness apply to the whole of the space between the point of the coccyx and the lower end of the genital fissure, it is commonly used in a more restricted sense, and indicates that space which exists between the lower end of the vulva and the anus. It is from an inch, to an inch and a half in length. It is covered externally and below with skin. It is limited above by the vagina, and posteriorly by the rectum; for, as the vagina and rectum are united by what is called the recto-vaginal septum, it is evident that the triangular space existing betwixt this septum, the fourchette and the anus, must constitute the perineum, using the word in its common acceptation.

It is very thick in some women, and feels extremely hard and resisting; in others it is very thin, soft, and easily dilated. Upon its rigidity or its extensibility depends the amount of time which will be required for its dilatation by the foetal head, or other presenting part.

I have already mentioned that the anterior edge of the perineum is, in many women, but little below the top of the pubic arch, and that the vulva is not distended until after the perineum has been pushed outwards and distended. It does sometimes happen that more than one half of the foetal head escapes from the lower strait, carrying out the perineum along with it, while the vulva is only opened enough to let the apex of the head emerge a very little. When distended in this way, the perineum is perhaps not thicker than the scalp, or even less, and covers the head like a cap, and instead of being from an inch to an inch and a half long, measures between three and four

inches. This great extension is sometimes kept up for a considerable length of time.

The time necessary for the complete expansion of the perineum is very different in labours. I have sat six hours by the bed after the head had begun to distend this part, and witnessed repeated efforts of the womb to overcome the resistance, the head being always pushed back into the excavation by the elasticity of the perineum, until at last, some long and powerful pain has forced it through the birth. It is very important, in making a prognosis, to have a very careful reference to the state of the perineum, as it, alone, often furnishes greater resistance, and consequent delay, than the os uteri, the straits, and the vagina together.

There are not a few cases in which it wholly refuses to dilate, and then the child is forced downwards at the expense of the tissue, which bursts or is rent asunder, allowing of the immediate egress of the head.

This laceration of the perineum generally takes place when the vulva is largely distended, the rupture commencing near the fourchette, and extending back as far as the anus, or even into the rectum. In other instances the child has been expelled through a laceration of the perineum proper, not including the fourchette or any part of the vulva, the perforation being made betwixt the anus and vulva.

When such accidents happen without involving the bowel or its sphincter muscle, no very bad consequences are apt to ensue, the parts readily uniting by the continued and close contact of the surfaces.

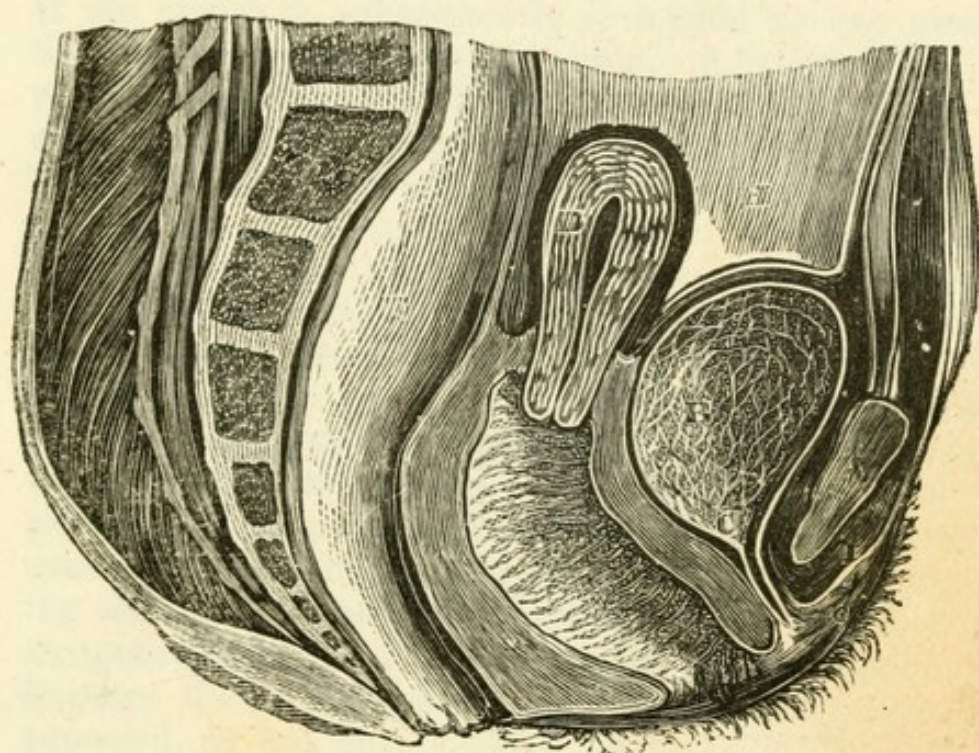
Should very hard and extensive cicatrices be formed in consequence of such lacerations, the vagina and perineum may be rendered less fitted for the distensions of a subsequent labour, in which great care ought to be taken to obviate the repetition of so very untoward an accident.

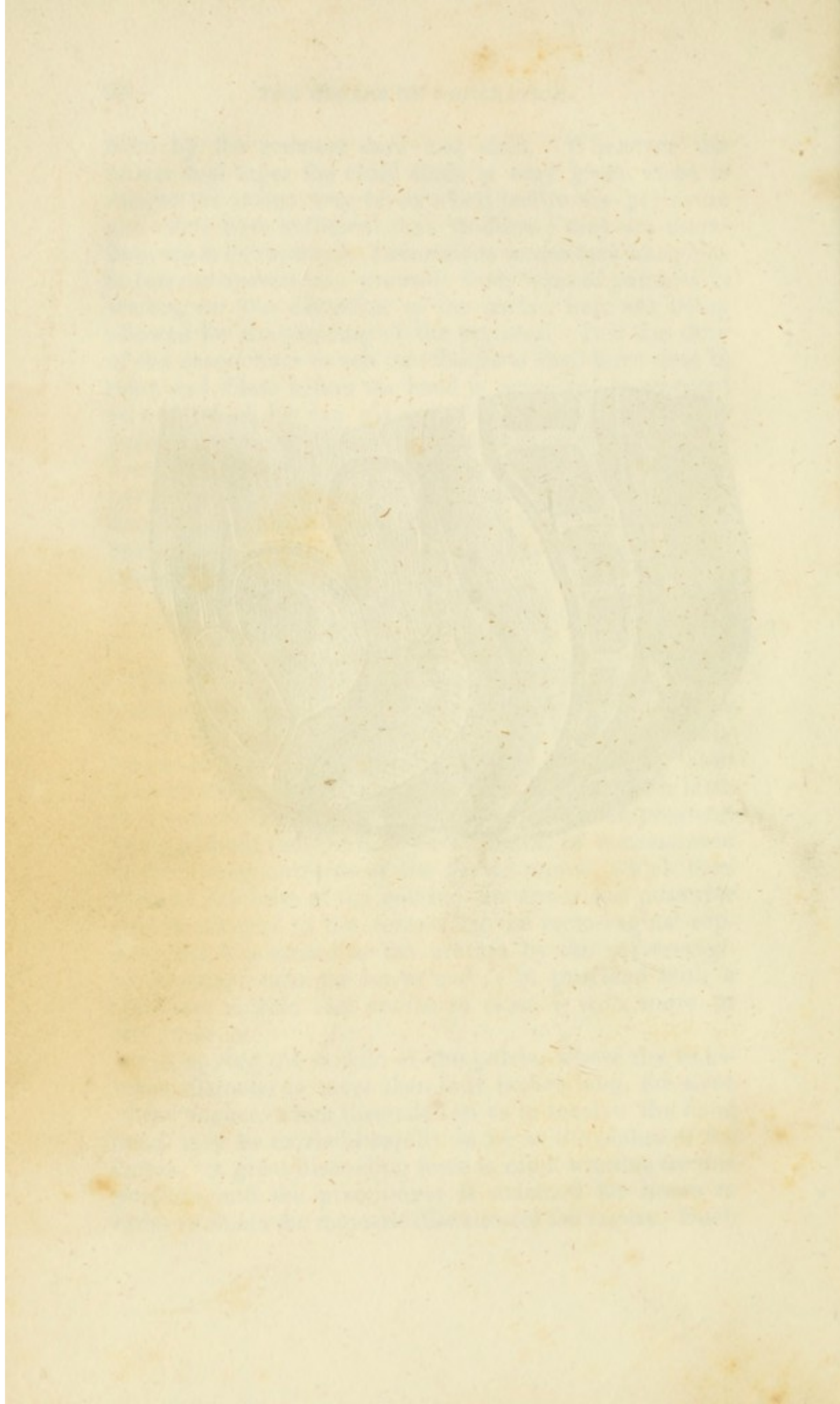
Lacerations do not always commence at the fourchette. I have already mentioned a case in which the lower third of the right labium was broken off, and an irregular lacerated wound extended from that point towards the perineum. The accident cannot be always avoided,

even by the greatest care and skill. Whenever the power that urges the child forth is very great, there is danger the infant may be expelled before the perineum and vulva have sufficient time to dilate : they are therefore, apt to be ruptured. Lacerations sometimes take place in forceps operations ; probably from want of patience in waiting for the dilatation of the parts ; time not being allowed for the yielding of the textures. It is the duty of the accoucheur to see that the parts shall have time to relax and dilate before the head is permitted to emerge ; an end which he can generally compass by aiding the perineum ; making pressure against it so far as he may dare, and thus, while the head is kept from advancing, permitting the tissues to acquire the proper temper or disposition to yield. This, however, will be more apropos when we come to treat of the management of labour.

The Vagina is a membranous tube that connects the external with the internal organs of generation. Its length varies in different adult persons, being commonly longer in virgins than in women who have borne children recently, and especially in such as have given birth to a numerous offspring. It is also longer in pregnant women about the fourth or fifth month, in consequence of the rising upwards of the gravid uterus, which then rests on the brim of the pelvis. Its upper and posterior part is attached to the rectum by the recto-vaginal septum, and it is united to the urethra by the vesico-vaginal septum ; near its lower end it is provided with a sphincter muscle that serves to close it with more or less force.

Occupying the middle of the pelvis, where the transverse diameter is more than four inches long, the sides of the vagina, when distended so as to receive the foetal head, may be carried laterally as far as the planes of the ischia. A great distending force is often wanting for this purpose, and the practitioner is detained for hours in order to obtain the requisite dilatation of the vagina. Such





resistance depends upon the unyielding nature of its own proper tissue, and not upon any opposition from the surrounding textures: there is nothing betwixt it and the ischia, except a very loose cellular tela, comprehended betwixt the folds of the ligamenta lata.

The lower end of the womb is attached to the upper extremity of the vagina. If the vagina become shortened and its two extremities approach each other, the womb sinks lower down into the pelvis than its natural level. If the vagina be subsequently elongated by any means, the womb is carried upwards again. A prolapsion of the womb is essentially a shortening of the vagina, and the cure of such prolapsion is to be effected by restoring to this canal its proper longitudinal dimension.

The internal lining of the vagina is a mucous membrane, abundantly furnished with mucous follicles, whose secretions lubricate the parts in health, and particularly during labour, when their presence is of the greatest consequence. The parts when deprived of it, by frequent examinations, become dry and inflamed, which prevents their yielding to the distending forces, whereby the patient suffers protracted distress that might be easily avoided by abstaining from the touch, and thus preserving the humid and soft condition of the organ. Too frequent touching not only removes the lubrication, but irritates the mucous membrane: it is greatly to be deprecated, as not only useless but injurious, as well as indelicate. A woman in labour should be examined as seldom as possible.

There seems to be a dissidence in the opinions of authors relative to the structure of the vagina, particularly that of its tunica propria, which is either a real fibrous tissue, or a mere condensed laminated cellular membrane. It is surely not areolar, and possesses no other contractility than that which is called elastic, and which is common to the whole of the cellular structure. It closes speedily after the passage of a child, even one of a very large size. In some instances, where the child's head has lingered long in the vagina, an hour or more elapses before its calibre becomes much contracted. For some hours after the birth of a child, the introduction of the

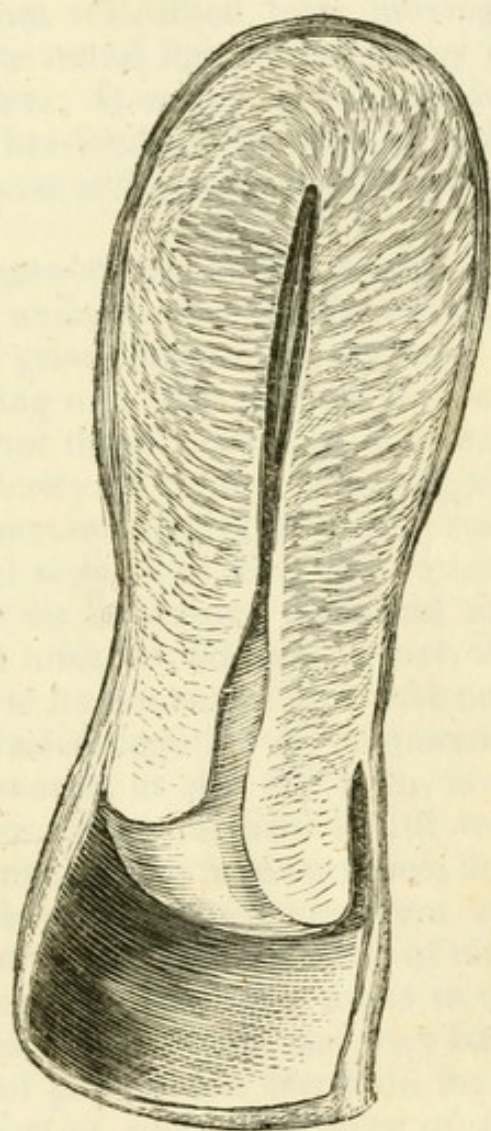
hand into the vagina may be effected with the use of very little force. The vagina is subject to eversion, or to complete inversion, where there is procidentia or *inversio uteri*. Of course, such accidents can never occur, nor can any tendency to them take place, without deranging both the bladder and rectum in consequence of their textural connexion with this organ.

The Uterus is attached to the upper end of the vagina. It is a pear-shaped body, compressed from front to rear, and varies from two and a half, to three inches in length, being larger in women who have borne children, than in those who have never been impregnated. It is divided into fundus, body, and neck; the fundus being the uppermost, and the neck the lowermost part of the organ. The vagina is united to the womb in such a way as to permit its neck to project a short distance into the canal; in this regard also there is great variety, some women having almost half an inch of the *cervix uteri* hanging down in the vagina, while in others the connexion seems to exist almost at the lower end of the cervix. *See the engraving.*

As the vagina is a curved canal, which proceeds backwards from the vulva, and upwards towards the rectum, it happens that the womb lies rather nearer to the sacrum than to the pubis. The womb is so situated that its long diameter is parallel to the axis of the superior strait, while the vagina is nearly parallel to that of the inferior strait: hence, at their junction, they make an obtuse angle, any derivation from which implies a displacement of the womb.

The breadth of the womb is about one inch and a half, its thickness about one inch.

Suppose half an inch of the *cervix uteri* to project into the upper part of the vagina; then, if the whole length be three inches, we shall have two and a half inches of the womb above the upper end of that canal. Such being the case, the womb would fall over to the right or left side of the pelvis, were it not restrained or stayed by



what are called its broad ligaments, which, passing from its sides towards the sides of the pelvis, keep it steady or prevent its assuming an oblique attitude ; it would also fall backwards towards the sacrum, and often become lodged or wedged under the promontory of that bone, were it not restrained from moving in that direction both by its round ligaments and by its connections with the bladder. It cannot fall forwards, for it is sustained by the *bas-fond* of the bladder, which, by filling with urine, must and would always push it backwards again.

The substance of which the womb is composed has not been fully understood. In the unimpregnated state, it is dense and gristly to the feel, and cuts very hard ; the cut surface being of a faint pinkish hue, and of a fibrous appearance ; but those fibres are disposed without any apparent regularity or order. It is supplied with blood vessels and nerves, which are very small during the unimpregnated state ; but the same vessels in the gravid womb acquire an enormous size, and are exceedingly numerous and tortuous, so that, in fact, the ovum at full term, appears to be contained in a vast net-work, or *rete vasculosum*, united together by a quantity of muscular fibres. The womb, at the full term, is an exceedingly sanguine organ, being furnished with torrents of blood from the uterine and spermatic arteries, the former reaching it from below, and the latter from above, with free inosculatation of the several channels of circulation.

Various attempts have been made to demonstrate the muscular fibres of the womb, and they have been divided into layers and planes and fasciculi, for that purpose ; but the very fact of such difference of opinion is proof enough that the arrangement of them is not yet clearly known. If it were known and demonstrable, there would no longer exist any dissidence concerning it, since whatever is clearly demonstrable ceases to be a subject of dispute or doubt. This much, at least, is well known ; viz. that the contractile fibres of the womb are capable of acting partially, or so as to change the form of one part of the organ while another part of it acts with less intensity, or not at all. Thus, it occasionally happens

that we find the uterus, after delivery, contracted in its middle, as if a string had been passed and drawn tightly round it, causing it to assume the shape of the hour-glass. This state is familiarly denominated an hour-glass contraction: again, we not unfrequently find the whole organ elongated, and almost of a cylindrical form; its fundus being raised high upwards towards the epigastrium, while the rest of it is narrow or slender like an intestine. I feel assured that I have sometimes found it, after delivery, full nine or ten inches in length, and not more than four inches in transverse diameter, estimated by feeling it through the relaxed integuments of the abdomen. These circumstances prove that the uterine fibres which affect the transverse diameter of the organ may act with force, while those which affect its longitudinal diameter are either in a state of repose or of very slight action; which leads us, as I think, to the inference, that the longitudinal and horizontal fibres are separate and independent organs, or parts, of the uterine structure.

If this be a just view of the case, it will serve for the explanation of occurrences in labour that would otherwise embarrass us not a little: for example, we find the woman in travail sometimes suffering under the most intense pains, and making the greatest efforts without the smallest profit; and that too where we know certainly, that the pelvis is of the amplest dimensions. What can be the cause that the child does not advance under such vigorous efforts? We find that the head is positively stationary; notwithstanding the healthiest pelvis conformation, and a sufficient dilatation of the uterus, and violent labour pains. We are at once satisfied and relieved of anxious doubts, when we reflect that the horizontal or transverse fibres are acting, and the longitudinal or perpendicular fibres are inert. There is a failure of co-ordination in the movements, and our duty will be clearly seen to consist in endeavours to restore the symmetry of contractile effort.

As this circumstance generally results from an excess of local or constitutional irritation, the former occasioned by tedious or violent labour, officious intermeddling, or the direct stimulation of ergotism; and the latter by a

too susceptible nervous system, repletion, mental emotions, or vain efforts of labour long continued: it appears that, in the former case, we ought to resort to the tranquillizing influences of laudanum clysters, cool air and drinks, and abstinence from impertinent handlings; whereas in the latter we may apply to the lancet, to a Dover's powder, to portions of morphia, or the black drop, or opium, after evacuations have been procured from the bowels by emollient and laxative injections; and that we ought to give orders for a full and free ventilation, and the use of suitable drinks.

But if it does sometimes happen that the movement of the horizontal fibres is inordinate, or in excess, it fortunately happens in the vast majority of cases that the powers of the longitudinal fibres are the greatest. The ovum being contained entirely within the uterus, it appears that it can only be expelled by the fundus approaching the os uteri; or, in other words, by the shortening of the womb, that results from the contraction of its long fibres. Let us remember that the womb is attached to the upper end of the vagina, and that the ovum, in passing out from the uterus, must necessarily traverse that canal. It will then appear that the first contraction of the longitudinal fibres will tend to pull the circle of the os uteri open at the same time that the point of the ovum is insinuated into the enlarging orifice. This opening or dilatation of the orifice does not take place without resistance, which is chiefly perceptible however in the early stages; for we find that while the fundus and body of the womb are vigorously condensed during a pain, the cervix also is strongly contracted, but less and less vigorously, as the dilatation becomes more considerable; so that, indeed, it is not rare to perceive the whole circle of the cervix yield readily, and as if without opposition, to the greater power of the longitudinal fibres. I have known the whole dilatation to take place during a natural sleep.

Some women require only a few pains to complete the dilatation, whereas others suffer hundreds of pains during several successive days, before the circular fibres

are conquered by the protracted efforts of their antagonists.

It requires a considerable experience and trained habits of observation to enable a practitioner to prognosticate the moment of delivery, making up his judgment from the intensity of the pains of expulsion, as compared with those of opposition or retention. It is certain that no man, be his experience ever so great, or his discrimination ever so acute, can with absolute certainty calculate upon the moment when any given labour shall be brought to a conclusion, since no one can absolutely predict what shall be the exact degree of intensity of any muscular force, which, as it is a vital operation, so it is dependent on causes beyond our knowledge or perfect control. Young and inexperienced practitioners ought, therefore, to be very slow in announcing their prognostic of labour.

I have remarked, that as the longitudinal fibres pull the os uteri open, the apex of the ovum is inserted into the opening; with each succeeding pain additional portions of the ovum pass into the os uteri, and through it, until at last the fundus having approached very near the cervix, the whole of the ovum becomes excluded from the uterine cavity, after which the same longitudinal and horizontal fibres, meeting with no further considerable resistance, act in concert, and thereby reduce the womb down to a very small size. It returns but slowly to the non gravid condition. From fifteen to thirty days are required to effect this reduction. Let it be remembered that the womb is capable of contracting equally upon an ovum at term, and upon an abortion of three weeks.



The Fallopian Tubes are membranous canals, designed to convey the fecundated ovule or germ from the ovary into the womb. They spring from the latter body at its upper angles, one from each angle. The other extremity of the Fallopian tube, called fimbria, or morsus diaboli, lies loose in the cavity of the pelvis, while in a

relaxed state, but when excited by the venereal orgasm it becomes erected, and is then directed towards the ovarium, the surface of which (in inferior animals) it has been seen to grasp tenaciously, for a period of time not yet determined. A communication is in this way established from the ovary to the womb, through the tube, and the fecundated germ passes, by some unexplained mechanism of vital action, from its nidus in the ovary to the uterine cavity, in which its subsequent growth is to take place, until the birth of the child.

The Ovaria are two small compressed oval bodies, one of which is found on each side of the womb, attached to its angles by a footstalk called the ligament of the ovary. Each ovary lies behind the Fallopian tube, and like it is inclosed betwixt the folds of the peritoneum, as it passes from the sides of the uterus in its progress towards the lateral parts of the pelvis, under the title of the broad ligaments. The peritoneum gives to the ovarium its outer coat, which invests its peculiar coat or capsule, inside of which is contained a condensed cellular tissue, enclosing, as in a gangue or matrix, several small translucent globules. These globules are the germina or rudiments of embryos. Some of them are very near the superficies of the ovary, and others are buried deep within its texture. When fecundated, these ovules, called also Graafian vesicles, are removed from the ovary by unknown processes; and after passing through the canal of one of the Fallopian tubes, are deposited in the cavity of the womb, in order there to undergo the changes that are described under the head of Pregnancy. When a Graafian vesicle leaves the ovarium, there remains in that body a yellowish red spot, which, from its colour, has received the appellation of corpus luteum. In process of time the corpus luteum disappears, and a cicatrix only remains to indicate the original seat of the unfecundated ovule.

CHAPTER V.

MENSTRUATION.

THE Menses is a discharge which is peculiar to the human female ; and if any analogies with it have been discovered in other orders of the mammalia, they are so faint and distant, that it is now conceded, on all hands, to belong only to women. It consists of a fluid resembling blood, and by some writers supposed to be blood, which is discharged at certain regular periods from the genital organs. Its first appearance is observed, in this climate, at the age of fourteen or fifteen years, and it ceases to recur from about the forty-fifth year of the individual's age. Those who are *regular* menstruate every twenty-eight days, or thirteen times in a year ; so that a woman who should continue to be regular from the time of the first eruption of the menses in her fifteenth, until its cessation in her forty-fifth year, would have near four hundred repetitions of the function.

Each catamenial period continues from three to five days ; so that the subject is not free from it more than from twenty-two to twenty-five days at a time ; and there are many examples to be met with in which the period of its duration is not less than seven or eight days for each menstruation.

It is generally supposed that five or six ounces of fluid escape on each of these occasions, but there is a very great difference as to the quantity yielded by different women, each one having a rate of her own, from which

she rarely varies, and it might be said, never, unless some circumstance may have interfered with her health. Deviations from the customary amount, either by excess or deficiency, are accompanied or followed by consequences which are more or less severe; the excess producing lassitude, loss of appetite, paleness and debility; while any deficiency as to the quantity is often accompanied or succeeded by vertigo, headach, pain in the loins, and a sense of weight or distress in the pelvic region, the phenomena being also, in many cases, accompanied by fever. The physician, therefore, who should be consulted with regard to any fault in the menstrual office, would overlook the most important considerations, should he fail to make himself acquainted with the constitutional habits of his patient, as to the quantity and periods of her catamenia.

In health the menses return with surprising regularity: a great majority of women expect it with the utmost confidence for a certain day of the week or month, and make preparations for its reception accordingly, frequently modifying their arrangements of business or pleasure by its indications. If she goes out or to bed, the woman makes ready for its reception by applying *the napkin*, used as a T bandage, to imbibe the fluid, which, but for such precaution, would frequently soil her dress, or expose her to deep mortification by falling down to the ground; for it should be remarked that the discharge, in a good many subjects, appears suddenly, and is quite free from the first moment, whereas in general it commences by slow degrees, increasing in abundance at the end of the first day, and declining on the last. Among the thousands of females who are seen in the streets of a populous city, how very rare is the occurrence of even the slightest exposure of their state from soiling or staining any part of their dress; which leads me to infer, that, even the most loose and reckless women retain a latent spark of modesty upon this point, amid the wreck of morals, and in the greatest depths of degradation and misery.

I am well aware that some persons are met with (very careless people certainly), who take no other precaution

against exposure than to put on perhaps a thicker or an additional petticoat; but this can only happen in those who are scantily regulated; not a few persons, in the most perfect health, being compelled to change the napkin at least twice, or even thrice in the twenty-four hours.

A little time only would be required to show that this natural office is, and has been the object of very peculiar regard, in ancient and modern times; and I am not at all surprised that some superstitions are still to be met with, in an enlightened age, on a subject which appears to have the greatest influence upon the health and stability of the female constitution.

Such is the sensibility of the sex in regard to the privacy required in respect to this office, that it is extremely rare for physicians to hear any person of refinement speak of it in direct terms: such a person generally alludes to, rather than pronounces its name; and if we may judge from an incident in the beautiful story of Jacob, the modest delicacy of the female was not less in the patriarchal ages, than in our more refined period of the world. When Jacob fled from his father-in-law Laban, Rachel hid the images which her husband had embezzled, under the camel's furniture, and sat upon them; so that when her enraged parent overtook the fugitives, he searched every where for them; but Rachel said to her father, "Let it not displease my lord that I cannot rise up before thee, for the *custom* of women is upon me." Gen. 31, 35. This incident shows that the same delicacy on the part of the female, and the same deference and respect on that of the male existed in that remote age as at present; and it is well known that this sentiment is nearly universal, without exception even of savage and barbarous nations or tribes. It is certain that a deep conviction of its importance exists every where; and the prevalence of that conviction doubtless depends on the fact that it does exercise a powerful influence upon the health and happiness of the female.

The Jewish law for women under these circumstances was very strict; and it is perhaps a traditional sentiment, that still commands, during the menses, a

total separation of the woman from the haunts and business of the male, among some nations of the North American Indians, as well as certain oriental tribes. There is a very prevalent opinion, even among our own people, that the presence of a woman with the catamenia is sufficient to cause the putrefaction of meats, the coagulation or souring of milk, and the failure of sauces, &c. While I suppose that such opinions are pure superstitions, I have been surprised with attempts made by good writers to explain the facts of such influences, which is at least equivalent to an acknowledgment of their existence.

The foregoing remarks might perhaps suffice to show to the reader, that a great deal of caution is demanded upon all occasions, where the state of the menstrual office becomes the subject of his investigation; and I need hardly observe that queries should be rather addressed to some third party than to the patient herself, particularly if she be young and inexperienced.

The ovaria of the female are not considered to be developed until puberty; and they are supposed to undergo a change of density from and after the "certain age" at which the menses cease. These organs, it is probable, exert a controlling influence upon the function now under consideration. It is curious, therefore, to compare the male and female in view of this subject. If we examine two children of equal age, stature and fortune, the one male and the other female, we shall find that they present few differences, except as regards their sexual conformation. They are alike in the respects of the brain and nervous system; the circulatory and digestive apparatus; the respiratory and secreting offices; the kidneys, spleen, glands, members, fancies, appetites. They breathe the same air—live on the same food—and think and act alike. The signs of puberty at length become manifest, and the female is suddenly transformed from the girlish to the womanly estate; a transformation not less remarkable from the changed appearance it produces in the corporeal than in that of the moral system.

The age of puberty is also marked by considerable

changes in the state of the male, but there is a point in which they widely differ. The female discharges, from one of her organs, a few ounces of a sanguineous fluid, which is the first of a series of near four hundred instances of a like occurrence ; upon the regular repetition of which her health, and even her existence may depend ; while the other never suffers any such discharge, nor does he need any. Both subjects attain to the age of forty-five years, and from thenceforth the female, like the male, suffers no discharge, and needs none. She enjoys better health, and is in a more natural state without it than with it. The character now becomes more and more similar to that of the male, from whose moral likeness she deviated with the first eruption of the menses, to return to it after their final cessation.

I am unable to say what precise influence upon these conditions is exerted by the ovaria ; but it seems not to admit of a doubt that they are greatly concerned in giving rise to the moral and physical peculiarities of the sex ; and in this view they become objects of interest to the medical practitioner.

Women deprived of the ovaria, neither menstruate nor bear children. They are also incapable of conception antecedently to the development of the ovary and the appearance of the discharge. Again, in advanced age, the ovaria become much shrunk in size, condensed, and marked by rugæ and botryoidal projections, which change is probably the cause that they can no longer furnish the objects of fecundation. Hence it is inferred that the ovaria are very intimately concerned with the function of menstruation. All discussion of the question, how those organs exert such a potent sway, is perhaps worse than vain ; nevertheless, I cannot refrain from the remark, that the highest erotic excitement is produced in the ovaria themselves, and is dependent upon them ; and that the venereal appetite ceases with their removal or destruction ; but the whole genital apparatus being a single system of organs, destined to the performance of one of the most indispensable functions of the race, viz. that of reproduction, I apprehend that we shall not be very wide of the truth in supposing that

a periodical erethism of the ovaria is communicated to the uterus itself, and results in the effusion from its vessels of a sanguine fluid, once a month.

I here repeat very distinctly, that women alone *menstruate*; yet many other mammalia have regular erotic periods or seasons, which are marked, among other symptoms, by a sanguineous discharge from the genitalia, an evidence of the preparedness of the system for the reproductive processes.

The erotic periods of many of the mammalia, birds and fishes, as well as insects, are very well defined. The excitation of the nervous and sanguine system is very plainly to be discovered in them at those seasons, and a secretion of sanguineous fluid then takes place from the organs of many species of animals. If such periodicity, with long intervals, may exist in one, why may not a similar periodicity, having the same ultimate object, the reproduction of the species, occur with much shorter intervals in another order or species? It is almost universally understood, that the catamenial act is in a great degree related to the reproductive faculty, being designed to renew or restore, or maintain its energy, until the period of existence when it ceases to be required.

I think it is scarce necessary for me to say that I do not attribute to the female who is menstruating any increase of the sexual appetite before, during, or after the flow of the menses, as is the case in the animals I have alluded to above. Nothing could be further from my intentions than to express such an opinion. It is, however, quite possible to believe (a common belief) that a greater physical aptitude for fecundation exists just after each repetition of the menses than before it; whereas, such physical aptitude implies no moral state, no sentiment, no passion.

What is the proximate cause of the periodicity, I deem it bootless to inquire; since this, like most other vital processes, has a sort of metaphysical subtlety, which defies all endeavour to grasp or retain it.

I am the more disposed to rest on the hypothesis above stated, as I cannot perceive the grounds of the doctrine of plethora, whether local or general, as causative of the

menses. This doctrine gives no greater satisfaction to the mind than that of lunar influence, or Dr Cullen's notion of habit.

General plethora cannot be its cause in those females who, notwithstanding very great weakness and exhaustion, continue to witness the regular return of the flow. The opinion that the discharge is necessary to give to the system the habit of creating a superabundance of blood, in order that it may become qualified to produce a supply sufficient for the pregnant condition, is at variance with our observation of facts in other animals, who do not have catamenia, and yet conceive and bring to perfection their offspring, failing as seldom perhaps as the more highly organized human female. In the midst of the difficulties surrounding this subject, resort is had to whatever circumstances may seem to throw an additional light upon it; hence, the speculators who find that a habit of plethora is requisite for the pregnant woman, have no difficulty in explaining how that plethora is kept within bounds, nor how natural it is for the author of nature to have so constituted the sexual organs, as, by means of the menses, to keep up the disposition to excessive hæmatisis as long as the female remains liable to pregnancy. But since the other orders of animals possess the reproductive faculties in as eminent a degree as the sex, I do not think that the idea of an habitual tendency to plethora, provided against the contingency of pregnancy, can hold as regards them; for it must be, and is, equally untenable in relation to the analogous state in all orders of animals.

It is certain, that in the course of medical practice we are often compelled to take blood from the veins of a patient who is on the eve of menstruating, and that too without in the slightest degree disturbing the regular course of the function; but it is considered advisable always to refrain from the lancet, if possible, on such occasions, since the failure of the natural office, that sometimes is observed to follow venesection, may be succeeded by long continued derangements thereof, to the serious detriment, distress, and danger of the patient. I have frequently suspended an order for venesection,

upon considerations of this sort; but I must add, that where the necessity for bleeding is pressing or decided, no considerations of the kind ought to have any force whatever.

Upon the question of a local plethora, very little is to be added to what I have said above. Nothing is truer than that in the vast majority of women, no visible modification of the nervous or vascular systems can be observed to take place upon the catamenial occasions. The discharge appears, continues, and ceases; and the female feels nothing different from her ordinary sensations. Many there are who labour, during a part of the period, under symptoms of congestion of the pelvic viscera; symptoms which vanish with the discharge; but all such are rather pathological than physiological states, and ought not to be taken into the account of the causes of the catamenia.

Writers speak of a greater redness and fulness of the womb and the ovaries, as occurring during the catamenial flow: to all such, the question might be very properly addressed, who has seen the womb and ovaries in this predicament? The post mortem results are often fallacious, and cannot pretend to declare what is the normal aspect for an average of myriads of cases.

It was anciently supposed, and the suspicion still lurks among the darker and more ignorant part of mankind, that the phases of the moon exercise a potential influence upon this curious function. It would seem to afford a sufficient reply to all such suggestions, that neither the phases nor culmination of the moon ought to be charged with such contradictory powers as to effect in one or one thousand what they prevent or nullify in the million: some women begin to menstruate each hour of every day in the year.

Considering then, as I do, that the menses are not to be explained upon the grounds of general plethora, local plethora, or lunar influence, I am equally ready to reject the idea that it has been derived from habit, and was not originally a female function, but a state superinduced upon the constitution by the habits of civilized life. The oldest records that we have show, at least, that it was

customary in the oldest periods of time ; for Sarah, the wife of the great patriarch, was old and “ well stricken in years, and it had ceased to be with Sarah after the manner of women,” as we are told in Genesis, chap. xviii. v. 2. This passage shows that Sarah was regulated early in life, and had ceased to be so at “ a certain age :” and the miracle of her pregnancy was so much the greater, as it was not customary for women to bear children after the cessation of the menses. So that the character of the female constitution has undergone no change, in this relation, during the long lapse of centuries since the patriarchal age.

Finally, to say that the menses are caused by a physical necessity is a transmutation of terms : the other and equivalent expression being, simply, We don't know ; we don't understand.

It is far more profitable to inquire what are the sources of the discharge. When a woman becomes pregnant, she almost universally ceases to menstruate. The womb becomes occupied with the ovum, and the canal of the cervix is plugged up with mucus, or filled with a mass of decidua. Hence, as no menstruation takes place where the womb is filled with the ovum, we may rightfully infer, that the elimination of the fluid is, by the presence of the ovum, prevented from taking place in its cavity ; and that, as the vagina, still unobstructed, does not yield the discharge, it must be evident that its seat can be nowhere except in the womb. Again, in cases of procidentia uteri, where the orifice of the womb juts out beyond the vulva, the fluid has been seen to issue drop by drop from the os tinæ ; and lastly, persons dying during the menses, have, upon dissection, been found to have the cavity of the uterus stained with the fluid, which could be also pressed out from its surface.

I am always surprised to hear it contended, that the menses are secreted or effused from the veins, and not from the arteries of the womb, for I see not how such an opinion can be sustained either by facts or analogy. The veins of the womb have no extremities opening into its cavity, and we are not aware of any lateral openings of those vessels communicating with the uterine

cavity, in the unimpregnated state at least. Do the veins secrete any where? It is not even proved that the bile is produced rather by the hepatic branches of the portal vessels, than by the extremities of the hepatic artery. It seems, therefore, gratuitous to attribute to the veins of the womb, a function of secretion or periodical effusion, which is not known to exist in any other veins of any other part of the system.

Haller was of the opinion that we ought to assign to the arteries the source of the menstrual blood, while the lochial blood ought to be attributed to the ruptured veins of the womb; but I venture the remark that it is not yet settled that any veins of the womb are ruptured, as a regular and usual occurrence in labour.

That the source of the menstrual discharge is in the womb itself, might be considered conclusively settled were it not that the discussion is occasionally revived by our finding women to menstruate regularly throughout an entire pregnancy; one example of which has fallen under my own observation. For the most part, those women who menstruate during pregnancy, continue to do so only until the seventh month, and cease to see any thing from that time. I can well conceive that such a discharge might take place, if not from the vaginal surfaces, at least from the unoccupied portions of the cervix uteri, both interior and external. If we reflect upon the great laxity of the union betwixt the membranes of the ovum and the lower part of the uterus, we need no great amount of credulity to permit the belief, that menstruation may occur from the lower points of the womb, which are, in many individuals, but very slightly connected with the apex of the ovum. That connection is, undoubtedly, in many cases destroyed long antecedently to the onset of labour. Those who will not accept of the above hypothesis, are compelled to resort to the notion, that a vicarious menstruation is effected by the vagina itself, and it is quite possible that the upper portions of that tube may be the source of the discharge in some of the cases of its occurrence in pregnancy.

The first issues are sero-sanguine; they become more decidedly like blood in the course of some hours; con-

tinue so during the greater part of the period; grow paler and paler; and, at length, cease entirely, leaving the surfaces bedewed by their ordinary excretions. It is a question whether pure blood is discharged. The major part of the physiologists in our country, regard it as a secretion resembling blood, but not containing fibrine or the coagulable principle. There is no doubt that, in the general, no clots or shreds of coagula are observable; nevertheless, Madame Boivin, whose knowledge of the whole topic is not inferior, perhaps, to that of any other writer, declares that it is blood like that from a vein.

“La qualité du sang des menstrues, ne parait pas différent de celui qui circule dans tout le système, lorsque la femme est saine, bien conformée, et qu’elle fait usage des moyens que la santé et la propreté exigent.”—*Mad. Boivin, Art. des Acc.* 105.

Haller says: “Sanguis menstruus de sana, neque immunda fœmina, rubore, calore, odoris absentia, nihil ab alterius fœminæ sanguine differt. Lentorem aliquem possit mucus admistus addidisse.”—*Physiologia, lib.* 28, *sect.* 3.

The few opportunities I have had of observing the appearances of the catamenial fluid, have been insufficient to enable me to come to positive conclusions: since healthy women admit of no such investigation; and the morbid specimens, which are the only ones submitted to us, are not to be considered as evidence of what occurs naturally. Madame Boivin’s account is, therefore, more worthy to be relied upon than that of any physician whatever. Madame B. can speak of the normal, and the medical man can only have access to the observation of the abnormal state or character of the discharge.

The argument in favour of the non-sanguineous nature of the discharge, drawn from the appearances of the fluid when detained for months in the organs, by imperforation of the hymen, is not of an inexpugnable force; nor does it follow that, admitting pure blood to be always produced in the case, coagulation of that fluid must take place in the womb, giving rise to painful contractions like labour pains, or the pains of abortion. It is easy to conceive that whatever quantity of fluid should

be effused within the small cavity of the womb, would immediately flow forth, in most cases, into the vagina, and thus give rise to no more pain than if it were non-coagulable. Whenever clots do accumulate in considerable quantity, they are either very soon discharged, or remain many hours in the cavity under severe pressure, which serves to express all their serum and most of their colouring matter; so that when the clot is at last expelled, it is found to be a mass of whitish fibrine resembling organic texture, and very commonly mistaken for a mola, or false conception. I have met with a good many specimens of this nature, which have required for their expulsion very tormenting pains, like those of abortion. These masses of compressed fibrine are not unfrequently so firm, and resemble so closely certain organic products, that they might readily lead an inexperienced observer into error as to their nature. It seems to me improbable that the small shreddy coagula which we witness in dysmenorrhœa should occasion the violent distress that is commonly, and too lightly attributed to their presence. That distress might, with far greater probability, be charged to the inflammatory action of the vessels, which produces the shreddy or deciduous matter in question.

The era of the eruption of the menses is not the same in every region of the globe. In general, the high northern latitudes are unfavourable for its early appearance; and the low latitudes are connected with its precocious appearance.

We are informed that the girls of the Deccan, of Java, Persia, of southern Arabia and of the Barbary States, become regular at eight or ten years of age, and are capable of fecundation at those early periods. But even in these cases I think the testimony extends no further than to the instances of certain distinguished and luxurious families. We are at least certain that the rule of precocious menstruation is not invariable for warm climates, since the young females of the banks of the Senegal are regular at the same epochs with those of the young persons of Paris or Philadelphia. Haller mentions the case of a girl in the Alpine valley of Emmen-

thal, who was delivered of a child at her ninth year ; and cites examples of the eruption of the menses at birth, at three months, four months, the second year, the third, fourth, fifth, sixth, seventh, eighth, ninth, tenth ; and says that he was daily in the habit of seeing a noble lady, of great beauty and wit, who was then in her ninth year, and who had menstruated regularly for some years past, without any injury to her health. She was very small and delicate.

A lady lately informed me that she was intimately acquainted, at Maracaibo, with a Spaniard, who gave birth to twins before she was fourteen years old, having previously given existence, in her first labour, to a healthy child, at which time she was not thirteen years of age.

In a few individuals the first eruption occurs at a late period, as at eighteen, nineteen or twenty years. Such persons suffer no sanitary inconvenience from the non arrival of the discharge, but its retardation is rather the result of a slow and languid development of the powers of the economy ; and its tardy appearance is more a consequence than a cause of some constitutional deficiency which may be supposed to exist in such persons. The Lapland women and those of the arctic regions, are well understood to be very late and very scantily regulated. The long enduring and severe frosts of those inhospitable climes are the sufficient causes of this peculiarity of their female inhabitants.

It is commonly believed that women who take very active exercise, and are engaged in laborious offices in the country, are far less abundantly regulated than the luxurious and pampered inhabitants of cities. There is also good reason for believing that northern women, transported to the hotter regions of the globe, suffer a very great increase of the catamenial flow, so as, indeed, to be brought occasionally into great danger therefrom.

I do not consider it out of place here to remark, in connection with this subject of scanty menstruation, that cold countries are not so favourable to the increase of population as the milder regions of the south. The reproductive faculty is not so vigorous where, in conse-

quence of protracted and severe frosts, the productions of the soil are not sufficiently abundant to support an immense population. We are accustomed to hear much of the "populous north" and of "northern hives," but, if in past ages, irruptions into the south have been made by vast hordes, who have seized upon its fertile plains and crowded cities, such irruptions ought not to convey to us an idea of the greater productiveness of the race in those northern regions from whence the barbarians issued. They abandoned their deserts en masse, with their wives, children and cattle, and their greatest armies were small, in comparison with the conflicting hosts that have met in our own days in every part of Europe.

The same differences that are observable in different women, as to the first appearance, are noticeable in what regards the final cessation of the menstruæ. They are expected to cease at forty-five; but many individuals lose them at thirty-five, or even earlier; while on the other hand, examples are recorded of persons in whom they continued so late as sixty, seventy, eighty, ninety, one hundred, and even to one hundred and six years. *See Haller's Physiologia, tom. vii. 141.*

Persons are occasionally met with in whom, after their cessation for years, they have reappeared, like the new teeth, new sight, and restored hearing, now and then recorded of aged people. Those in whom the office continues until a late period in life, are probably capable of conception while ever it lasts: children have been born of mothers above sixty years old.

As in the commencement, so in the cessation there is generally a gradation. In the very young female, the first show is commonly only a pale serum, which does not give place to the high coloured and thoroughly characteristic discharge, until several periods have elapsed, and the law of the sex acquires full dominion over her. When, too, a woman approaches near to the great climacteric, the age in which she is to become (technically) an old woman, the courses become irregular, returning twice or thrice in a month, then ceasing for a few months, and afterwards recurring with great profuseness. This state, which from its uncertainty is called *dodging*,

continues for a year or longer, when the function ceases, to return again no more. In many it stops suddenly; and I have been informed by some persons, on whom I could rely, that they had continued to feel perfectly well throughout the whole of this critical age; the discharge had stopped without return, and their health remained unchanged in the smallest degree. Not a few persons, however, will be met with, in whom disorders arise that are readily attributed to the cessation or decline of the catamenia.

Certainly no long disquisition is necessary here to show why a female should have troubled health about this time of life. It is a time of crisis. The menses have exerted a potent sway, and even dominion over her economy for thirty years; their slightest disorder or obstruction has been accompanied with headach, colic pains, fever, indigestion, and other symptoms, that vanished upon the re-establishment of the natural issues. As a general rule, no long continued habit can be suddenly broken off without more or less inconvenience. The suppression of an old seton, the healing of a long open ulcer, are not unfrequently followed by troublesome consequences; and it appears perfectly consonant with reason, as well as with experience, that women should become at this time the subjects of dropsy, atrophy, consumption, cancer, and liable to a general break-up of the constitution. Prudent persons should be very attentive to the first manifestations of disordered action at this term; and he is but a reckless practitioner who puts off the complaints of such patients, with the assertion that "it is only the change of life," and thus, like those who think that the beginning of consumption "is only a cold," allows his patient to be immedicably diseased, before attempts are made to avert or restore. There is, no doubt, a very great responsibility resting on those who, by failing to bestow a proper attention upon the complaints of women at this crisis, suffer them to become fixed; whereas they might have been easily averted or cured, by prompt and diligent attention in their inceptive state.

CHAPTER VI.

AMENORRHŒA.

IF a girl reaches her fifteenth or sixteenth year, and falls into disordered health, her catamenia not making their appearance, she is commonly presumed to be labouring under Amenorrhœa, to which is attributed the vicious state of her constitution, and which it is supposed must be removed, in order to admit of a more perfect play of the powers of the economy. Those who have never had it are said to be labouring under *emansio mensium*, or retention of the menses; while those who have already been regulated but are now deprived of it, are said to be affected with *suppressio mensium*, or amenorrhœa.

There are many causes that may suffice to prevent a young person from menstruating, when she attains the usual age for it, besides that general torpor or slowness of development of which I have already spoken. Thus there may be a total absence of the uterus; or the uterus may possess a faulty conformation. The canal of the cervix may be imperforate. The ovaria may be wanting. The vagina may be imperfectly developed, or of monstrous form. The entrance to it may be closed by adhesive inflammation, or by an imperforate hymen.

If the non appearance, at due time, of the menses should depend upon a general deficiency of the vital forces, it would be easy to verify the cause, by carefully observing and comparing the play of the great functions;

and upon their being found to be free from any special disorder, the inference would be strong in favour of a mode of treatment calculated to excite and invigorate the whole system; or the prudent physician might advise that no treatment should be adopted, but rather that confidence ought to be placed in the powers of nature, which, in proper time, can overcome disorders of this particular class. But in all cases of *emansio mensium*, it is of the last importance for the medical adviser to reflect carefully upon the circumstances of the patient before instituting any plan or method of cure.

Is it not notorious among the profession that the medical treatment of amenorrhœa is eminently empirical, unsatisfactory, and unsuccessful? It must be admitted, that the subject is, in a practical view, a very difficult and embarrassing one; nevertheless, I feel much persuaded, that a more considerate, and a more rational attention devoted to the cases which fall under our notice, would enable us more frequently to administer relief, without being obliged to resort, as we are now, often to every one of the *menagoga* in succession, and in vain.

A blister applied to the thorax often cures a pleurisy, upon the principle that "*pars dolens trahit*," or the principle of counter irritation; it is equally true, that any considerable external or internal fixed irritation may prevent or counteract the natural tendency of the system to produce catamenia. A wet stocking, a draught of cold and damp air, produces in the skin a certain condition which frequently serves to prevent or arrest the menstrual offices; a fortiori, therefore, some latent disorder of an important viscus or organ, would scarcely fail to interrupt, or, in some measure, trouble this delicate depurative act. Hence, instead of opening the great volume of the *Materia Medica* and searching under the head of *Menagoga* for some specific means of removing the difficulty, let the medical man carefully study the state of the patient's health, endeavouring by repeated inquiries to learn the case of the several great functions, and that of numerous minor ones, in order, in their excess or deficiency, to find a cause of the amenorrhœa, which he will then be able to treat

with the reasonable methods that a perfect understanding of the case will suggest to him.

It is not to be supposed that if a woman's constitution can be brought into healthful play in all other regards, she will be vicious or disordered in this instance, of amenorrhœa. I grant that sudden arrests or stoppages may take place from slight and perhaps local causes; but I speak now of the instances of rebellious obstructions. I wish to impress the idea that a woman is not unhealthy because she fails to menstruate, but rather, that she fails to menstruate because she is unhealthy. Let us suppose a case. A young woman has her feet wet the day preceding that on which she should be regular. She gets a rigor, succeeded by fever, intense headach, vomiting, pain in the loins and hypogastria, &c., all which phenomena are results of the violent reaction of the system upon the morbid impression of cold and dampness. The symptoms frequently appear before the time of the flow, and they continue with more or less severity until the show takes place, when they are immediately relieved; or, as is often observed, they are first relieved by a venesection or purge, after which the show makes its appearance; or they may wholly prevent the menses from coming down, and be the first instance of a long series of failures. It appears to me to be quite clear that in a major part of such cases as I have supposed, a sound philosophy leads us to endeavour to subdue the constitutional disturbance by the proper means for that end, so that the patient may recover in order to menstruate, and not that she may menstruate in order to recover.

The treatment of acute cases by venesection, purgatives, warm baths, camphor, opium, &c. &c., shows conclusively that physicians appreciate the real principles of such practice, and it is therefore the more suprising that they are many times, in chronic cases, observed to abandon reason, and follow the most empirical, crude and indigest notions of treatment.

Of all the great functions, none, I am persuaded, is so intimately related to the menstrual affections as that of the circulation. Let its condition be fully investigated

and understood: is there an improper momentum of the blood directed upon other organs? is it excessive without particular determinations? is the movement of the blood enfeebled? does the patient, by exercise or labour, compel the circulation in the capillaries of the muscles to be sufficiently active and free to obviate the tendency which is acquired to the central or visceral congestions and engorgements so ordinary in the sedentary and lazy?

Inquiries should always be made concerning the state of the hepatic functions. Is there a torpid or obstructed portal circulation? and can the whole venous circulation of the chylopoietic viscera collected in the portal vein be vicious without in some measure affecting that of the genitalia? If the bile is acrid, or weak, or deficient, it will cause disorders of the alimentary canal, that must retard or hinder the natural tendency of the vital movements in the womb and ovaria. In such circumstances, attempts made to restore the health by forcing medicines, for of such are most of the class *menagoga*, will rather serve to fix and rivet the irritation, than to remove it; at least, they are generally fruitless. If she be menaced with consumption, for example, she early loses the catamenia, and a pressing demand is made upon the medical attendant for its restoration; but rash attempts to effect it by means of *emmenagogues*, are quite as apt to bring on hæmoptoe, as the more natural discharge which is the object of so great solicitude.

The skin has an intimate relation, by sympathy, with the whole of the mucous system, whether respiratory, digestive, or genito-urinary. It cannot be, therefore, too carefully looked to. In amenorrhœa it is, for the most part, dry, pale, and not sufficiently elastic. In extreme cases it becomes so much altered, so opaque, harsh and disagreeable, as to attract the attention very peculiarly. Its chlorotic colour gives to bad cases of amenorrhœa the title of green sickness, or chlorosis. Such a state must be inseparable from an engorged and obstructed condition of the viscera; which, whilstever they are oppressed and crushed under the masses of blood imposed upon them, can never cease to be the centres of movement for the sanguine as well as nervous systems, and

thus divert the tendencies of fluxion that ought to exist towards the uterus. If we recall the blood to its legitimate channels, by restoring to the skin its proper energies, in removing the visceral obstructions or torpor, the amenorrhœa ceases, and the rate of all the functions becomes equalized. Moderate bleeding, local or general; purgatives; an emetic; frictions with the flesh brush, or with salt, or dry mustard; the warm bath; a blister judiciously timed; the wearing of flannel next to the skin; exercise on horseback; walking, as a regular duty; dancing and various gymnastic amusements—all these may be safely looked to as means of relief, far more to be depended upon than the empirical administration of drugs, whose *modus operandi* is, in general, but darkly suspected, and never fully understood.

The removal of corsets and all tight bandages or dresses, and the rigorous prescription of flannels, stockings, shoes, shawls, &c. must not be deemed unworthy of the physician's attention, any more than the dietetic regulations, which should always correspond to the wants of the case for the time being.

After having subdued or mitigated the local disorders, and the constitutional disturbance arising from them, if the sanguine apparatus of the womb still fails to act properly, in yielding the catamenial discharge, the time is arrived for resorting to the emmenagogue articles.

It is a general complaint, that we have, as yet, no good emmenagogues; and that the uncertainty in regard to their operation, is as great as that of the diuretics. It would seem, indeed, that the *materia medica* includes no article that exercises an immediate or specific action upon the womb, if we except the *secale cornutum*; and even of its powers much question is still made, notwithstanding a great deal of experience already had of its employment.

Among the articles of the *materia medica*, those are most to be relied upon, as emmenagogues, which exert an indirect influence on the womb by sympathy with the bladder or rectum: such are *cantharides* and *aloes*; by the administration of either of which, we have it always in our power to produce a very considerable excitement

in the pelvic viscera. The action of the womb upon the rectum and bladder, is well known to be very decided : tenesmus, dysuria, and other graver affections accompany some of the uterine diseases. So, too, when the bladder is highly irritated by cantharides, or the rectum by drastics, the uterus partakes of the excitation or increased vital action. In fact, it is found that aloetics and cantharides are among the most successful of the emmenagogues. I am convinced that these articles are ordinarily administered without sufficient boldness, and that they ought to be freely employed whenever they are indicated.

The operation of these medicines upon the womb may be greatly promoted by the occasional employment of the hip-bath; the pediluvium with infusion of mustard, and full draughts of infusion of some aromatic herb, especially the pulegium. The tincture of black hellebore, in doses of a teaspoonful, has often been in my hands followed by a restoration of the menstruæ. The dose should be repeated every six or eight hours, being followed by the use of an aromatic infusion. The volatile tincture of guaiacum, the decoctions of seneca, of madder, of serpentaria, the tinctures of castor, of aloes and myrrh, and the chalybeate preparations are all justly chargeable with the great uncertainty as to their operations, of which Dr Cullen so loudly complains. They undoubtedly do succeed now and then, when happily timed, and furnish, at least, an armamentarium medicum, from which the enlightened and judicious practitioner can select the means of combating the principal disorder, after he shall have first mastered the constitutional disturbances, which in general offer the most considerable portion of the resistance he has to contend with.

The reader will have remarked that I have given but a penurious detail of remedies for amenorrhœa, but I shall excuse myself, on the ground that experience has shown me the little dependence that is to be placed upon the drugs that are dignified with the title of menagoga; and I shall entrench myself, upon this point, in the works of Dr Cullen, to whose *Materia Medica* I refer those who, aware of that great man's perfect candour

and consummate judgment, will no longer feel disposed to censure my meagre announcement of medicinal agents, when they shall have seen how utterly dissatisfied the Edinburgh professor was with the entire fallacious class of emmenagogue articles.

Dr Cullen says, in speaking of the emmenagogues, that they are "a set of medicines the most unfaithful; and very frequently disappointing our expectations from them. The writers on the materia medica, both ancient and modern, particularly the former, mention many medicines as emmenagogues, and I have employed a great number of those recommended by them; but I have been so very often disappointed of the wished for effects, that I have ventured to allege that the ancient writers had not, on this subject, spoken from experience. These disappointments that I have met with, I find to have also happened to my fellow practitioners: I have not, amongst the most experienced, found any one who does not acknowledge his failures in employing the emmenagogue medicines recommended by writers; nor who does not own that he cannot, almost in any case of amenorrhœa, with much confidence, promise success in curing it."—*Mat. Med. vol. 2, page 407. Edit. Phil. 1812.*

CHAPTER VII.

DYSMENORRHŒA.

THE term Dysmenorrhœa is applied to those cases in which the act of menstruation is accompanied with pain in the region of the uterus.

The disorder varies in intensity in different individuals: being in some very slight, and occurring only occasionally, as in consequence of cold or some temporary derangement of the health; whereas, in others, it constitutes one of the greatest sources of distress to which the female is ever obnoxious, the menstrual office being never performed without agonizing pain. I have met with individuals who entertained the greatest dread of the approach of the catamenial period, from the certainty they had of passing through an ordeal of extreme anguish.

It is quite common to be told that menstruation, even in the healthiest people, is ushered in by certain uneasy sensations in the back and loins, and a sense of weight, fulness, heat, or aching. In general, these symptoms disappear as soon as the discharge becomes free, and they leave the female perfectly comfortable throughout the remainder of the term. In such slight affections it is not common to ask for medical advice, as the subject of the disorder generally refers it to nature and time, or has recourse to some simple warm aromatic infusion, a foot bath, and rest.

But, a female who has been improperly exposed to cold and dampness, may suffer more severely during the cata-

menial function. The irritation has fixed itself upon the uterus, and produces in it a high degree of nervous excitement, which may be gradually abated as the excretion takes place. If the pain and irritation should have gone so far as to excite a general disorder of the economy, manifested by fever, restlessness, headach, vomiting, and pains in the limbs; an enema, a free bleeding and some anodyne dose, such as an anodyne enema, or a pill of opium and camphor, with a warm pediluvium, will, in general, suffice to subdue all the constitutional manifestations, while the liberal effusion that follows from the womb, in a short time extricates that organ from the local embarrassment to which it had been subjected. The next succeeding menstruation may be perfectly natural. Such a case of simple dysmenorrhœa is not unfrequently met with, but it differs widely from other instances in which the patient acquires a regular habit of suffering at each return of her monthly indisposition.

Notwithstanding what Madame Boivin says, as to the identity of venous blood with that of menstruation, I am well confirmed in the belief, that it is far from common to observe, in the periodical discharge, any considerable amount of clotted or coagulable material; and yet, some individuals always find a portion of shreddy matter upon the napkin. Such persons always, I think, suffer no little pain during the catamenia. This circumstance may arise from the difference of coagulability in the blood of different people. I have, in a good many instances, seen coagula which presented the appearance of compressed masses of boiled veal; the red globule having been completely broken up, and the colouring matter expressed or squeezed out, leaving a reddish white clot of fibrine in the organs, which, after a greater or less period of time, has been forced out from the womb by a real contraction of the fibres of that hollow muscle. The violence of the contraction has generally been in proportion to the size of the clot. One person who was under my care, repeatedly discharged such clots larger than a black walnut, and with pains no less severe than those of abortion, since they effected a considerable dilatation of the cervix and os uteri, and required an expulsive force

equal to what is demanded for the extrusion of any early abortion.

These clots, which result from a true dysmenorrhœa, are generally mistaken by the patient for false conceptions, or moles; from which, however, the attentive and skilful observer is able easily to distinguish them by the absence of any real organization.

In a uterus that is affected with a more or less severe inflammatory diathesis, the menstrual office is, for the most part, accompanied with a very high degree of vital action of the organ, causing it to excrete, as in conception, a caducous matter that has been supposed to be similar to the deciduous coat of the gravid womb. The discharge of this decidua is attended with severe pain, rendered greater, probably, by the excessive irritation of the womb, which causes all its contractile efforts to be more acutely painful. Such a state of the womb may be fully expected to cause sterility, which ceases when the gestative organ returns to its ordinary and healthful condition. Some of the instances of dysmenorrhœa of the kind just mentioned, have been relieved by antiphlogistic treatment, and the patient has been afterwards the subject of pregnancy.

I have had more than one occasion to know, that in the treatment of these disorders, it is highly important that the most accurate information should be obtained concerning the condition of the womb itself; and I think that upon making a proper representation to the patient, or her friends, the practitioner's request to make an examination per vaginam will be met by no perverse rejection or denial. It is not to be doubted, that where, from long continued dysmenorrhœa, the womb has been the seat of a preternatural irritation and affluxion, the organ will, in many instances, be found tumid and painful. Such a state as this, when once fully ascertained, will throw much light on the nature of the treatment to be adopted under such circumstances as these, which are to be met with far more frequently than is generally conceived of.

Rest, in a recumbent posture, continued for the space of several weeks, tends greatly to the subduction of the

congestive and inflammatory disorder of the womb. The patient ought to be made fully aware of the import of the term *rest* in her case ; and, so far as my personal experience serves me, I think that it is easy to gain the consent of the patient to confine herself to a couch or sofa for four or six weeks. Under this absolute rest, great good may be expected from the proper use of bleeding, whether general or local. The former is always to be preferred, where the state of the system makes it allowable ; the latter, or local bleeding, will very properly follow the general, and may be practised either by leeches or cupping. In the use of leeches for the object at present under consideration, we may order them to be applied within the vulva, or on the groins, so as to cover the round ligaments, as they issue from the abdominal ring. These abstractions of blood are followed by great relief, and should be repeated from time to time, according to the state of the case, which ought to be noticed by an occasional repetition of the operation of touching.

During the course just now recommended, the patient should use a purgative or aperient dose every third or fifth day ; such as a portion of blue pill and rhubarb, or the sulphate of magnesia. Those days in which no aperient is given should be employed for the administration of antimonials, in such form as the physician may select.

I shall take the liberty of stating here, that I am in the habit of preferring the precipitated sulphuret of antimony, combined with small portions of camphor, and sometimes with morphia or opium. This article I find to be as little offensive to the stomach as any other of the antimonials, and it may be used for a considerable length of time without inconvenience. Where it may be deemed necessary to add to it some more powerful deobstruent article, the blue mass, or calomel, may with great propriety be employed, in moderate quantities, the patient being always kept under a strict inspection, in order that, upon the least appearance of the constitutional excitement peculiar to those who are under the use of mercurials, the article may be at once withdrawn.

The diet ought to be carefully regulated. Bread and

tea, or milk, constitutes a sufficient breakfast and supper. The patient may be allowed to take mutton, or chicken, or fish, every other day, along with wholesome vegetables and fruits; while on the alternate days the dinner ought to consist of bread or rice puddings, plain boiled rice, gruel, or the preparations of sago, tapioca or arrow-root.

A semicupium, or a whole bath, of a moderate temperature ought to be used every fourth day. These precautions, in addition to a careful adaptation of the dress to the state of the weather or season, will scarcely fail to recover the uterus from its irritated and abnormal condition, so that it will perform its menstrual function with all the regularity and facility that we have a right to expect from that organ, when in its best and most healthful state.

I cannot pass over this part of my subject without adverting to the statements made by Dr John Mackintosh, of Edinburgh, in relation to the cure of dysmenorrhœa by means of the bougie.

This gentleman having met with some preparations of the uterus, in which the canal of the cervix uteri was remarkably small—so small as barely to admit a common silver probe, conceived the idea, that, in such a state of the organ, menstruation must of necessity take place with difficulty: he gave the subject a careful attention, and concluded that a mechanical dilatation of the canal might result in the cure of so painful a disorder. Dr M. informs us that he hesitated for some years to carry his idea out in practice, until, in the year 1826, he met with a remarkable instance, that he details at length in his work. Since his commencement with this new practice, he has treated twenty cases of dysmenorrhœa, of which eighteen were cured.

This method is, to introduce a metallic bougie, of a small size, into the cavity of the cervix, and carry it up to the fundus uteri. In proportion as the treatment progresses he uses bougies of a larger size, until the dilatation of the canal has become sufficiently ample. He applies the bougie from the size of the common silver probe up to that of the bougie No. 8. or No. 10.

In general no unpleasant symptoms have followed the use of the instrument, and the practice eminently deserves the title of successful which produces the cure of eighteen out of twenty cases.

Dr Mackintosh's successful cases occurred as follows. Eight were either in young unmarried women, or in women in a state of widowhood; ten were married and living with their husbands; of these ten, seven afterwards became pregnant. Dr M.'s very interesting account of his method may be found in his Principles of Pathology and Practice of Physic. American edition by Duff Green, Washington City, 1834.

CHAPTER VIII.

LEUCORRHŒA.

LEUCORRHŒA, Fluor Albus, or Whites, is a very troublesome complaint, which, like amenorrhœa and menorrhagia, appears to me to be commonly treated with so very little regard to sound medical reasoning, that I have resolved to say something of it in this place, from which I might, perhaps, have very properly excluded it, on the ground that the subject is too copious to be admitted into a small work of this kind: it would be impossible to give a full account here of an affection so important, and depending upon complications so extensive and diversified in their nature as the disease in question. My object could only be to state some of the generalities of the topic, referring the reader who is anxious for more particular information, to the books, which are already numerous.

I shall commence then with the remark, that all secreting organs are liable to be so changed in their nature or actions, as to produce secretions deviating from what is natural, in respect to their quantity or quality. The product of the secreting surface of the nares, the bronchia, the alimentary canal, are all of them obnoxious to very great modifications, when their several sources are labouring under various grades or stages of irritation or inflammation. We find the mucus of the nose become a profuse distillation of hot coryza, or assuming the appearance of laudable pus; bronchial mucus may be-

come gluey and adhesive, or short and puriform; or it may be tinted throughout with blood; or it may become almost serous, under various states of disease. The mucous apparatus of the genitalia, like that of other parts, may be affected with discharges morbid in quantity and quality. These mucous or catarrhal disorders have a general resemblance to each other, whatever be their seats or sources. They all compose a group, the history of one individual of which serves to throw much light upon that of the others.

I have translated the following passage from Vigarous, as containing a very clear and succinct account of the origin and progress of a case of Fluor Albus, which ought to be read with interest by those who are acquainted with that writer's reputation and authority, upon the maladies of the sex. Vigarous says, tom. i. p. 235, "At first the patient perceives a discharge of mild matter, almost always whitish, which moistens the vagina and escapes drop by drop. She experiences no inconvenience, no pain, nor any morbid sensation. Hence women, prevented by an excess of modesty, take no precautions in this stage, and neglect a disease which at this period, is of easy cure, but which soon becomes obstinate. Women pass several years in this way before the danger is exhibited by severe symptoms.

"After the lapse of some time, more or less, and after all precautions and all remedies have been neglected, the urine becomes thick, and according to Hippocrates, similar to that of mares, *jumentosa*. The pulse is vermicular; the discharge becomes so abundant as to soak through the napkins which she employs; the matter becomes, successively, greenish, yellow, black, and similar to washings of flesh; it becomes acrid, and occasions pain, excoriations, ulcers of the womb; the women take an aversion to *coitus*; the face becomes pale, bloated; the eyes swell and are surrounded by a yellow circle, as in dropsical people; they lose their lustre and become heavy and dull; the appetite is lost; grief and sorrow take possession of the patient; the senses are weakened, particularly vision; sighing and lassitude, upon the slightest exertion, indicate the greatest

debility. Gradually the smell of the matter becomes insupportable; the menses flow irregularly, often are suppressed; and hectic seizing the patient soon drags her to the grave."

Leucorrhœa is an exceeding common complaint; but as the vast majority of cases are slight, producing even less inconvenience than an ordinary cold in the head, physicians are not told of it, and it disappears spontaneously, like other slight catarrhs, leaving the patient in as good health as she enjoyed before the occurrence. Cleanliness, rest, a restricted diet and an aperient medicine, suffice to remove cases of such a slight nature, and are spontaneously resorted to by the well informed female.

Unhappily it is not always so simple an affection as the one above mentioned; and when it does become rebellious and obstinate, greatly endangers the general health of the patient.

The leucorrhœal matter may be formed either in the cavity of the uterus, or in the vagina, or the inner surface of the labia; and much difficulty will exist in endeavouring to ascertain from which of these parts the discharge is produced. The diagnosis relative to the precise seat of the disease will rest mainly upon the nature of the constitutional affections developed along with it, and not upon inspection of the parts themselves, which, even could it be obtained, would not readily yield any certainty, except, indeed, in those aggravated forms which are connected in the disorganization of the tissues that may have become visible or tangible.

Leucorrhœa occurs at any time from infancy to old age. I have seen very obstinate examples of it in children of two years old; and many persons are afflicted with it at from fifty to eighty years of their age. I have a patient who labours under it in her eighty-first year.

For the most part the discharge is, in its commencement, mild, resembling thin buttermilk. As the malady progresses, the matter assumes the appearance of pus, and at last acquires a greenish hue, like that of gonorrhœa, after which it becomes more viscid and translucent,

diminishing in quantity, until nothing more is produced, than the natural and healthy secretions of the parts.

In severer examples, the irritation becomes chronic, and may continue for a great length of time, with alternate meliorations and aggravations of the symptoms; until, the constitution feeling the influence of the local malady, the health is broken, and the state of the patient is now, for the first time perhaps, communicated to a physician.

If it take place in a menstruating female, the discharge may either continue all the time the catamenia are flowing: or it may be suspended for that time, in order to return with great violence, upon the cessation of the menses; but growing less and less severe as the term for the next menstruation approaches.

The amount of the discharge is, in general, not so great as to require the wearing of a napkin; the patient freeing herself by the occasional use of the bidet. In some examples the product is very great, soaking through napkins and dresses, and occasioning by its tendency to putrefaction, the most noisome stench. In some individuals, who are careless in the point of cleanliness, the nature of their situation is often involuntarily disclosed to the medical man by a sort of hospital smell, like that from a sore leg; while perhaps the patient herself, accustomed to the odour, is not in the least suspicious that her disorder is known or even surmised to exist.

A very slight degree of it is frequently met with in pregnant women; but it disappears after labour. In some pregnant women the discharge has been observed to be enormous, and fœtid in the highest degree. I am not aware that it is peculiar to any particular stage of pregnancy.

A good many women are troubled with it after lying-in; and a few examples occurring after parturition have proved exceedingly obstinate. I have not found that bad, or laborious, or instrumental labours are more likely to be followed by it, than others of a perfectly natural and moderate character.

It may take place in consequence of cold or dampness, want of cleanliness, debility, local irritation, or preg-

nancy, *venus nimia*, pessaries, polypi, or ascarides, which occasionally collect in considerable quantity in the vagina, having passed into it across the perineum. Constitutional disorders tend to involve particular organs in disease, and doubtless many examples of leucorrhœa may be traced to affections of the generative organs arising from distant irritations, as those of the liver, stomach, &c.

The disease is known by the discharge of a whitish, a yellow, or green fluid from the vulva; by paleness and sallowness of the skin; loss of strength; emaciation; and by pains in the back and loins. Where the malady has made great progress, it is capable of subverting the functions in general, to a degree which can only be accounted for by reference to the powerful control or influence exerted upon the whole of the functions by the genitalia. The bad cases are those in which the womb itself is in fault: for the constitution is frequently found to bear, without much distress, a long continued purging, or a loss of blood from piles; whereas it suffers excessively, if the discharge of leucorrhœa be only somewhat profuse. Menorrhagia, too, may be quite profuse in some individuals, without causing so great a depression of strength or spirits as is occasioned by no very violent fluor albus. In all such cases, then, as affect the patient somewhat deeply, I am accustomed to think the seat of the malady is rather in the womb than in the accessory organs, since those organs are far less capable of exciting extensive morbid sympathies than the uterus itself.

The great danger of mistake in the case, consists in the proneness of medical persons to adopt the views of their patients; and in the present instance, since muscular debility is one of the most constant phenomena of the disorder, it is very difficult to avoid the contagiousness of expressed opinions. If our patients exclaim against weakness, we tend to regard them as weak, and act accordingly, i. e. by exhibiting bark, port, and other heating drugs, whose only inherent tendency is to augment rather than abate the local, and, through them, the constitutional disorders. The various chalybeate and aromatic tonics

that are prescribed for the disorders of the menstruating organs, I am well persuaded, do as much harm as good, and, at least, they commonly fail of success.

I feel it incumbent on me to reiterate here the opinion, that medical men too frequently satisfy themselves in regard to the pathological condition of these patients, by a mere general examination of their symptoms and complaints.

The symptoms occasioned by several disorders of the genitalia are so similar, that the practitioner ought not to trust himself to decide, without the most thorough inquiry. I have seen a supposed case of bad leucorrhœa, in which the patient, although long under medical care, had never been Touched until I was called to see her; and I immediately learned that the entire cervix uteri had disappeared under the destructive progress of a corroding ulcer. I found on one occasion, an old cork pessary, entirely deprived of its coating of wax, which was causing a most distressing leucorrhœa, that ceased upon the removal of the foreign body. A polypus, by its presence and pressure, can hardly fail to occasion a degree of mucous irritation which cannot be expected to cease until after the removal of the polypus. A prolapsed state of the womb is very often met with in leucorrhœa, and may be justly suspected of maintaining an unnatural irritation of the mucous textures, as well as of every other part of the genital apparatus. The removal of such a prolapsion, by the appropriate remedies, permits the leucorrhœa to cease.

It ought to be evident from the foregoing remarks, that duty to our patients, and a just regard for the success of our practice, urge us to demand the privilege of examining by the touch, the actual condition of the parts, in all those cases of leucorrhœa that prove somewhat rebellious under treatment.

The mode of treatment should be founded upon the nature of the discharge, as being either acute or chronic; and upon the degree of constitutional disturbance already developed by it. The affection may exist in an individual so weakened and exhausted by disease as to put out of question the use of means adapted to lessen the

force of the general circulation. But, while I make the above admission, I am free to say that such a case will rarely be met with. There are few American physicians who would hesitate to employ the lancet for the cure of a rebellious menorrhagia, no matter how feeble the patient might be; and inasmuch as the excretion of puriform mucus is an action depending upon excited vital force, quite equal in intensity to that which causes pure hemorrhage, the use of the lancet appears to be as clearly indicated, as a general principle, in the one as in the other. It is not necessary to have a hard and bounding pulse, in order to warrant the use of venesection. A patient who is able to walk across the floor can almost always bear the loss of a portion of blood without great inconvenience; and that inconvenience is, generally, not to be put in comparison with the invaluable influence of bleeding, upon all the emunctories. Bloodletting, therefore, ought to be more freely and commonly resorted to in the management of fluor albus.

Rest, in a horizontal posture, is capable of effecting great changes in the distribution of the blood, in the rate of its circulation, and in the secretions derived from it. Hence a recumbent position, at least, ought to be commanded, and continued as long as we have reason to suppose that any inflammatory condition of the womb or vagina is maintained. The circulation becomes much more equable and calm, and is carried on with less effort, in a horizontal attitude than in any other, even leaving out of question the stimulating influence of the muscular exertions employed by those who walk or ride.

Purging, carried to a certain extent, is a valuable adjuvant. The whole mucous system is connected by a common sympathy: impressions made on one part of it lessen the influence or degree of impressions made upon another part of the same system. The operation, therefore, of a purge, which acts upon the stomach and bowels, is well adapted to lessen the determination of the forces towards the genitalia.

A regulated diet, which tends, when properly conducted, to bring the body into the most perfect health, ought not to be lost sight of. It should be thoughtfully

adapted to the state of the patient, for the time being, and may be so adjusted as either to concur with the tendencies of the venesection and rest, or so as to excite and stimulate, if it be deemed requisite to elevate and quicken the vital movements.

Cleanliness. I have been surprised to find a good many females not very careful of their persons, in the particular respect under consideration. Certainly we have a right to expect, that, in those who permit the discharges to remain upon or within the organs, an acrimony will accompany the fluids excreted, that is well calculated to increase the amount of irritation that produces them. A female with leucorrhœa should use the sponge, with tepid water, or wine and water, several times a day. She who fails in the regular use of such ablutions is deserving, in the highest degree, of the imputation of filthiness.

Injections of astringent substances into the vagina, are among the commonest expedients for the relief of these complaints; but they will not be had recourse to by the prudent adviser, until by means of the remedies already mentioned, the irritated organs have been deprived of the inflammatory excitement that first gave to the mucous surfaces the habit of secreting in preternatural quantity. For the cure of ophthalmias, few men of experience can be found, who would employ very astringent collyria at the very beginning, or during the greatest height of inflammation, congestion and excitement; and the same rule ought to be observed in our malady.

Whenever, by means of rest, by purging, by diet, by strict cleanliness, and the other means already pointed out, we shall have succeeded in abating the symptoms of irritation in leucorrhœal disorders, we may with propriety resort to the injection of vegetable and mineral astringents into the vagina. Decoctions of Aleppo galls, of rhatania root, of preparations of kino, alum, sulphate of copper, limewater, &c. may be had recourse to with good prospect of success, as abating in their use the bad habits of excessive secretion that the mucous organs had long been suffering.

Profound sleep ought to be procured at night, under

the influence of black drop, morphia, or other convenient preparations of opium, in order not only that the system may recover, by repose, the vigour which results from sleep, but also that it may be less susceptible of the irritating or enervating impressions made upon it, by a local disorder, in an organ endowed with so many sympathetic relations as the womb. The various balsamic medicines enjoy a considerable power of modifying the action of the mucous surfaces, and are, therefore, much resorted to in chronic catarrhal disorders. The balsam of Copaiba is perhaps the best of them, and should be given, after the foregoing treatment has effected a reduction of the force of the malady, in doses of a half drachm or one drachm, in combination with five drops of oil of cubebs, and from twenty to forty drops of sweet spirits of nitre, at least three times a day. I do not know a better medium for the exhibition of so disagreeable an article as the copaiba balsam, than the syrup. bals. tolu-tan., which not only serves to correct the disagreeable taste of the principal article, but likewise conduces to the therapeutical result that is aimed at.

Dr Dewees in this country, and Drs Forbes, Robertson, and Traill, in England, have given great credit to the tincture of cantharides for its power to cure fluor albus, after due preparation of the system for its reception. It may be given in doses of from ten to thirty drops, three or four times a day. It doubtless tends, by its power, so often manifested, of irritating the bladder, to effect a change in the action going on in the pelvic viscera generally. I am, however, of opinion that it is not always safe to excite so powerful an irritation, as this article is capable of developing, in the mucous membrane of the urinary organs, since those irritations are occasionally found difficult to remove.

Baths, either warm or cold, ought not to be neglected in our attempts to cure this perverse disease. The warm bath will be chiefly indicated in those cases that are marked by great weakness, as they occasion a more gentle and gradual reaction than the cold. In proportion as the patient recovers her strength, she should take a bath of a lower temperature, until at length, she shall

find herself enabled to employ one quite cold, without inconvenience. The sea bath, at the proper season, I have known to prove of the greatest utility in bad cases of our disease. With the gradual return of health, an improvement of the diet ought to be allowed, with a little red wine at dinner, until exercise and country air may be looked to as the means of eradicating the last vestiges of the malady.

CHAPTER IX.

PREGNANCY.

HAVING now examined with such care, and minuteness of detail, as were compatible with the plan of this book, the chiefly interesting points relative to the pelvis ; the organs of generation and their diseases ; the function of menstruation and its principal disorders ; we pass next, to the subject of Pregnancy, which is naturally ushered in by that of Reproduction or Generation, and leads us, afterwards, to enter upon the consideration of Labour or Parturition.

There have appeared a great many speculations and theories upon the subject of Generation : yet it is true that, however ingenious or inventive their authors, or however eloquent or argumentative in urging the adoption of their peculiar views, there still remains a terra incognita, which human sagacity, perseverance and toil have never been able to explore ; and which seems purposely set beyond the reach of the utmost stretch of human wisdom or learning.

It must ever, we should think, remain impossible for man to comprehend the secret mysteries of those proximate causes, by the force of which, a non existent, or formless being is drawn forth of the dark stream of time, and launched out on the boundless ocean of eternity ; made partaker of a prospective immortality ; charged with the burthen of responsibilities to God and his fellow creatures ; and bound by numerous liens to the phy-

sical world, of which he has also become a part by the very fact of his entrance into a moral state. Such a subject, therefore, cannot fail to prove interesting to the medical student, whether he approaches it in view of its physiological connections, or whether he wishes to investigate it as a psychological inquiry of the utmost importance in any system of moral philosophy.

What subject indeed could be more replete with interest, than one which pretends or seeks to explain all the changes that are experienced by the embryo, from its first discoverable estate as a drop of pellucid lymph, up to the time when it comes forth into the world endowed with all the powers that are appropriate to a healthy, full grown fœtus at term ! Such a topic involves a comparison of its organs with those of the adult animal, and a history of their growth and development. It ought also to comprise an account of the accidents and diseases to which it is exposed or liable, and a full detail of all the peculiarities of the ovum and its several parts, and a comparison of them with the similar parts in various animals. The subject comprises therefore a vast field of physiology, which might be profitably explored by the curious student ; but the limits of this work are too confined to admit of it being treated of at length on this occasion. The older writers made a very comprehensive use of the term *Generation* : as for example ; Ambrose Paré, whose treatise on the “ *Generation of Man’s Body* ” is a treatise on midwifery as it was known and taught at the time in which he flourished. I shall make use of the title of *Pregnancy*, on this occasion, to introduce such remarks as I may deem relevant on the subject of generation ; the nature and state of the fœtus, and that of its adjuvant parts ; the changes that occur in the womb itself, and the consequences of those changes upon the woman who is the subject of them.

Generation is a function of living beings : its object is the propagation of a race or a species : and it is effected by the union of two sexes ; for, although some organized beings exist, which are found to be capable of the generative function without the conjunction of two individuals ; yet in such a case there is a double sex—the being

is an hermaphrodite, possessing both the male and female organs of generation, as, for example, the monœcious plants and some zoophytes, as the common earth worm, the medicinal leech, &c. There are also many cryptogamous beings whose modes of reproduction are not as yet understood; but it appears to me not conformable to sound analogies, to suppose that nature has, in such cases, deviated from the general uniformity of her laws, and cast aside a principle that may be so widely traced in her operations for the maintenance of her organized species on the globe.

It may be true that there are gemmiparous beings, in the true sense of that term; and we know of many that are easily propagated by budding, or engrafting, or by cuttings; yet these I regard as no true examples of generation. They are rather propagations, extensions, pro-tractions of the same individuals. The *ego*, the *ipse* is not truly changed; and though the stock or body from which the bud, or graft or cutting was taken, should perish, it might exclaim, in the language of Virgil, *Non omnis moriar, pars saltem manet*. Such a propagation is the result of art—it is an invention. I doubt not that some germ or seed, rendered active by a sexual orgasm, exists in all reproductive beings, at once the means and guarantee of their duration as species on the earth.

I said generation is a *function*: it is not a property, like impenetrability, or any other property of brute matter; a rock or a clod does not beget sons and daughters. Our Alleghanies have been piercing the heavens with their tops since ever the creation of the world; they do not die, and live again in their offspring; and when Bonaparte told his soldiers, before one of his great battles, “Forty centuries look down upon you this day from the summits of yonder pyramids,” he meant to say that those masses of stone were the contemporaries of four thousand years; but the Andes and Alleghanies are the contemporaries of all time; they are yet standing as they have stood, unchanged, since first the fiat of the Maker raised them up above the clouds. How is it with man? I ask not how it is with men. Men are like the morning cloud, and the early dew, which quickly vanish away;

but man, like the mountains, is the contemporary of all time: the globe is his dwelling-place; and the words of prophecy are sure and steadfast, that when man shall cease to inhabit it, it will be given up a prey to that fervent heat which shall melt the very elements of it, and roll away the heavens as a scroll. Man lives on it, therefore, while time endures; but he lives by a succession of generations. He is of the trunk that God planted in the garden of Eden: the blood of Adam flows in the veins of each member of the race.

What a subject for contemplation! To-day the veil of non-existence is round about us: we issue from nothing—we are fashioned and modelled, in our physical properties and moral attributes—endowed with faculties, burthened with responsibilities, and placed upon the platform where we play our parts: we sink again into the obscurity of death—our bodies become dissolved and enter into new combinations, while our spirits fly to unknown regions, bearing with them all that is noble and enduring of the work of our Maker in us. What an extraordinary scene! Eight hundred millions of us in all; and twenty millions, at least, who come upon the stage like shadows, and so depart, every year. Men are but the bond of union betwixt the earliest and latest generations of the race of man. If, as has been eloquently said, the springing up of a blade of grass from the bosom of the earth is calculated to fill the mind with wonder and amazement; what far more vivid impressions of the miracles of nature, are likely to be made upon those, who contemplate the unfolding of those organs and faculties, by means of which, man learns not only to know and acknowledge his Maker, but to render himself, as it were, a still more fitting image of him, by the cultivation of the powers that have justly given him the title of the lord of creation!

Sensible as we are of the darkness and doubt that involve this subject, we feel bound to give it a place here; and shall proceed, therefore, to state very briefly, that there are three principal theories of reproduction: of which the 1st contends that the fœtus is constituted of a mixture of particles, or molecules, derived from both the

father and the mother ; the 2d, that it is derived wholly from the father ; the 3d, that it is derived wholly from the mother.

William Harvey, the celebrated discoverer of the circulation of the blood, had published, about the middle of the seventeenth century, the doctrine that all animated beings are derived from ova or eggs ; but it was not until 1670, that Regnier de Graaf asserted that the female ovaria were not testes fœmininæ, but that they were real ovaries or egg bags, and that the transparent vesicles within them were ova. It was from him that the ovaria derived their present name.

The substitution of the doctrine of ova, or the development of pre-existent germs, for that which had long reigned in the schools, and which supposed a real generation to take place, greatly changed the philosophy of this subject, for it had for ages been supposed that the embryo “ *duplici de semine constat*,” to use the language of Lucretius ; and that the new being resulted from the action of a *formative power*, upon a material or substance subjected to its plastic forces.

Yet, even supposing that the mother does furnish a semen fœmininum, it was asked, Can the conjunction and adventitious mixture of two liquids, consisting each of a few drops of mucus, result in the formation of a living, moving, sentient being ? Does not the analogy of the seeds of plants, the eggs of birds, and the spawn of fishes, fully show that the primordia, the rudiments of their respective kinds, exist, without exception, in a germ more or less perfect, according to the nature of the plant, bird, fish, &c.; and will nature, who provides the beginnings of her creations, by establishing the faint lineaments of their organization, in seeds, eggs, &c.—will she depart from her known simplicity and economy of means, in the case of man and the mammalia in general ? On the contrary, nature, who is always consistent, establishes the bud, the germ of our existence, before we really begin to exist. The doctrine of Lucretius is no longer tenable ; the doctrine of “ *duplici de semine constat*” is not true ; but that of “ *omnia ex ovis*” is true.

This doctrine did not enjoy an undivided reign very

long. The curious researches of philosophers soon enabled them to discover in the prolific fluid of the male, a great number of little animals, or rather animalcules; and then they asserted that the ovists were in the wrong, for these little seminal worms were assuredly the germina of human beings, and thus there was a new doctrine—of spermatic animalcules. So that we have now under revision three hypotheses:

1. That of the union of two seminal fluids.
2. That of Ova.
3. That of Animalcules.

Let us now return to the first: the doctrine of the union of particles from both parents. I shall state what was thought by Buffon and Blumenbach; for it is not worth while to go further back than this.

The illustrious Count de Buffon admits the Graafian vesicles, but says they are not eggs, not ova; they are only *reservoirs* of female *semen*, which flows out of them by means of the funnel-shaped mouth of the Fallopian tube; and passing through the Fallopian tube falls into the womb, and is there commingled with the seminal fluid injected by the male.

He says that, common, brute, or dead matter has only physical properties; it cannot grow nor germinate—it is subject to physical laws and impulses only. Brute or dead matter, and vital or living organic matter cannot be, therefore, one and the same. No: there really exist in this world a vast number of little organic molecules or entities—entia—beings. The air, the earth, the waters are full of them. The world is a huge magazine of them, and they are common to the vegetable and animal kingdoms. Vegetables and animals appropriate them for the purposes of growth and support. They are primitive, incorruptible and unchangeable; and their assemblage and conjunction under certain forms, constitute the various beings that exist on the globe. A given number and arrangement of these molecules make a man, a horse, or any other animal, according to their construction. Generation and growth, therefore, are only changes of form and arrangement and aggregation of these vital, molecular entities; while, on the other hand, disorgani-

zation and death mean the disaggregation and removal of these deathless monads. If I have been happy enough to explain myself clearly thus far, the reader will have no difficulty in understanding how this philosophy is applicable to the theory of generation. These molecules which are floating about in the world are disposed to occupy certain places in the creatures whose bodies they assist to compose; indeed they are a sort of *idea* of the organs which they help to constitute; for example, there are nose particles and ear particles and finger particles, which cannot become toe particles or knee particles, or molecules of the heel. They have a sort of constitutional habitude or aptitude for certain forms, but not for all forms. Every living being, whether man or cabbage, hippopotamus or tadpole, is composed wholly of organic molecules, equally capable of giving physical expression or form, as the inorganic molecules that compose the mountains and strata of the earth.

To proceed. The fœtus in utero grows daily in size, by adding molecule to molecule; its term of utero-gestation is completed; after its birth, the child still appropriates molecule after molecule, out of the inexhaustible magazine of nature. It arrives at the estate of manhood. Whatever it has been hitherto enabled to hoard up has been employed in strengthening it and bringing it to perfection. It has, hitherto, had none to spare—it has acquired no more than are necessary for its existence. But when it has attained to manhood, and the powers and habits of self appropriation are completely established, by long use and custom, it no longer grows, and therefore collects more molecules than are needful for mere nutrition. The arm, the head, the leg receives more than it wants; hence, as the vital molecules have a constant tendency to assume organic forms, they shoot out, as the beard, the whiskers, the hair of the body, the female mamma: hence, too, the beautiful rotundity and plumpness of the female form, at that lovely period of the teens; and hence the menstrual flux, which is but an overflow of the superabundant vitality. Hence, also, the new secretion of the male testis, and the turgid state

of the Graafian vesicle, which is filled with organic molecules.

In his view of the subject, both the fluid of the vesicle, and the semen are to be regarded as extracts, a sort of inspissated molecules of the whole body; these extracts being composed of organic particles, which have an indefeasible tendency to organize, to set up a constitution. They come to the testicle and ovary from every part of the male and female body. No portion of the machine, no tissue, membrane or ligament is without its representative in this *cour plenièrre* of vitality. Liver, heart, membranes are all here, but in chaos, in confusion. The great point is, that they have a tendency to reunite according to their ancient constitution; and they only wait for a favourable situation and a certain impulse, in order to re-arrange themselves in one form and place, as in the ancient regime, and as their archetype father had done when he was but a mass of trembling jelly. Thus, by a plastic virtue of the two semens, under orgasm, the embryo form is gradually unfolded, and runs the same race its parent had run before it. The male and female semen are united in this constructive act; hence arises the similitude to both parents, or the predominant resemblance to one or the other, like the families of Dentatus and Rufinus of ancient Rome—like the Bourbon noses and Hapsburg lips of more modern days. One seminal fluid could not germinate; it must be mingled with that of the other sex, and must derive from the venereal orgasm an impulse, a sort of augmented vital force or excitement. To use an American phraseology, which though not elegant is expressive—it must get a start.

Such is the theory of Buffon. I hope the reader may understand it from our statement—but not believe it. It is a pretty philosophical romance; and argued so eloquently and ingeniously in the first volume of his *History of Animals*, that I trust every student will take an opportunity of studying it out at length. It will well reward his pains, by the exquisite beauty of the style, and the rich stores of facts which he has collected for its sustentation.

I suppose that a dozen arguments against the Buffo-

nian theory, of the mixture of particles from both parents in generation, have presented themselves to the mind of the reader already : as first, the ovarium does not secrete any semen fœmineum—it is not a testis, but an ovary ; and second, an animal that has lost any one of its parts, as a limb for example, is not, on that account, incapable of procreating a perfect offspring—but if so, whence are the monads of the offspring derived, since the parent had lost them ?

Let us leave the Buffonian doctrine here, and now inquire what is meant by Blumenbach's Nisus Formativus, for Professor Blumenbach holds the old opinion of Lucretius, the “duplici de semine constat.”

The favourers of the doctrine of ova entertain the opinion of pre-existing germs, as I am about to explain ; but Professor Blumenbach regards the idea of pre-existing germs as repugnant to reason—as implying a superfluous and useless creation of innumerable entia, that can never arrive at perfection : for as one pair are sufficient to people the whole earth with their offspring, the death of that pair involves, of course, the blight of so many germs as might serve to fill and populate the globe for an unlimited succession of ages.

Hence he prefers the doctrine of Epigenesis, or what he denominates the Nisus Formativus, by which a real, but gradual formation of an embryo out of the before formless genital matter is brought about.

“Vital powers,” says Professor B. “exert their peculiar influence on the matter of organized bodies. *That* vital power which, acting on organic matter hitherto shapeless but mature, imparts to it a form, regular and symmetric, but varying according to the nature of the matter in subjection, is distinguished from all other kinds of vital force, by its ability to produce form, construction, arrangement, constitution, organization, or whatever such term may best explain my meaning. There are digestive powers, nutritive powers, discerning powers [this is a formative power, he calls it ‘nisus formativus’]. When mature genital matter is properly placed in the uterus, the nisus formativus begins to operate ; lays in it the rudiments of a conception, and gradually evolves

its organs, preserves them such during life, and reproduces or restores them when lost or mutilated by diseases or accidents.

“Some time is required to enable the seminal liquors to become intimately blended. When that is effected, the *nisus formativus* converts them partly into the embryo, partly into its membranes, and partly into the placenta; hence several days always elapse before the product of conception is formed or observed in the cavity of the womb.

“The advocates of ‘germs,’” says M. B. “must resort at last to a *nisus formativus* to explain the development of those germina, which, without the interference of the generative act, would remain for ever in the state of germs, and never arrive even at the embryo state.”

In the above extract, I find it difficult to comprehend what M. B. means by “an organic matter hitherto shapeless but mature.” That great philosopher, by seeming to require a sort of maturity of the material upon which his vital power is to be exerted, in order to the formation of an embryo, does virtually admit an antecedent state of preparation of the material, which differs more in name than in truth from the opinion which contends for pre-existent germs. A germ is but the material in a state of preparation; and the shapeless but mature matter of M. B. is the same thing. This may serve to show the difficulties that surround this subject; since M. B. has found himself compelled to admit an antecedent state of preparation or maturity of the matter of the embryo, in order to avoid the alternative, of admitting a real and direct creation by means of the reproductive power.

These remarks are all that I have thought needful to offer the reader concerning the doctrine of the double semen: let us now take up that of the animalculists.

There was a young physician who formerly lived at Dantzic, from whence he went to study medicine at Leyden, in the year 1677; his name was Lewis Hamme, or Hammen. About that time every body was engaged in microscopic observations, for it was the rage of the day, and this young Lewis Hamme was as fond of his lens as any modern pathologist of the dissecting knife.

Among other curious objects of research he took it into his head one day to examine the semen masculinum through his lens, and found it full of little animalcules, like vinegar eels or tadpoles, and was so very much pleased with his discovery that he went to Delft, where Anthony Leewenhoeck lived, and not only told him what he had found, but actually showed them to that gentleman. He was well served for his pains, as he was fairly deprived of all the credit, if credit there could be, of first inventor; for Leewenhoeck, who had heard all about De Graaf's ova, soon found that with these very small monads he could make a very great noise in the world; and so it proved.

This person was born at Delft, in Holland, in 1632, and acquired a very great reputation all over Europe, by the admirable microscopes he constructed, and the extraordinary discoveries he made with them. He pushed his researches on the seminal animalcules to an almost incredible extent. He describes them as having a head and tail similar to those of the tadpole. They are extremely active, always in motion, moving their tails like a snake; approaching each other, and even uniting in a sexual embrace. He thought there were male and female monads, and that the difference of the sex was pointed out by the form of the tail. They were very small; so very small indeed, that fifty thousand of them were quite comfortable in a drop of semen no bigger than a grain of sand. They exist in the semen of all animals, from man down to a louse. There are more animalcules in the semen of a single millipede, than there are men, women and children on the whole globe, although these are computed to amount to eight hundred millions.

Like many other philosophers, Anthony Leewenhoeck taught that no sentient, moving being could be constituted out of mere inorganic molecules; which, as they are inert, brute and dead, cannot become alive, sentient and active; and therefore he insisted that the germs of such creatures must pre-exist. He would not admit the Graafian vesicle as the germ, but asserted that his animalcules are the rudiments of the fœtus, which being

injected into the maternal organs, had nothing further to do than grow and be born in due time.

Hartsœcker and Valisneri also made painfully minute examinations of these little creatures. Hartsœcker quarrelled with Leewenhoeck about the date of discovery, asserting that he had seen them first; but he is commonly supposed to have made an unfounded and unjust claim in this case. He could not only see them very clearly, but he traced their resemblance to the human form. He found that they would stick their tails into the ovarian vesicles, and, like so many weasels, suck them dry.

Valisneri saw them also very clearly; speaking of them in the semen of a rabbit, he says, "*ē gli riconnobi, e gli giudicai senza dubitamento alcuno, per veri, verissimi, acchiverissimi vermi.*"

It is surprising what a run this doctrine of spermatic worms had, and, notwithstanding the occult nature of the research, what various classes of persons engaged in it, assuredly without any other prospect than that of either gratifying a prurient curiosity, or discovering a useless truth. Dr Elliotson, in a note in his edition of Blumenbach's *Physiology*, portrays in the strongest terms the extraordinary scene of curious inquirers into these arcana of nature: his statements show how the power of imagination is capable of misleading the judgment, even in matters relating to natural history. Dalemptius is said actually to have seen a seminal animalcule assume the form of a human being. Even the august monarch of England, Charles II., was engaged in the microscopic observation of these animalculæ; an additional proof, if any were wanting, of the profligacy of that king. Dr Elliotson says, that "*Physiologists, naturalists, popish priests, painters, opticians, and booksellers, all eagerly joined in the pursuit,*" &c. But what has been the result of all the noise made in the world upon so unworthy a subject, which, evidently, never could have been deemed really worthy of investigation. No solid good has arisen from it, and we may agree with Dr Elliotson, who says, "*Sure, never were so much folly and beastiality before committed,*

under the name of philosophy."—*Elliotson's Blumenbach*, p. 290.

When Leewenhoeck was asked how he could reconcile it to the order of nature, that so many millions of animalcules should be formed to waste, since only one could become a man, he replied that the fact is exactly conformable to the order of nature, who prepares myriads of seeds that never grow, but are wholly lost and destroyed. And further; as there is only a very minute pore in the Graafian vesicle, into which a spermatic worm must find its way, there would be a million chances to one against its ever reaching that hole, if there were only one animalcule in each ejection of semen; but if there be a million of them, there is an even chance that at least one will find the opening.

A spermatic animalcule, therefore, according to Leewenhoeck, gets ensconced inside of an ovarian vesicle, and there grows.

It is now evident that this doctrine of spermatic germs is susceptible of being carried so far as to imply the existence of germs in a series mounting up to the original creation, and descending to the very end of time. If a man cannot produce or create the germ of his son, but must have him pre-existing in his body, a fortiori that germ will be unable, and so on ad infinitum forwards, and backwards to the very genesis.

We now come to the third and last opinion, that of Harvey, De Graaf, Spallanzani, Bonet, Haller, and others. This opinion holds that the child is derived wholly from the mother, and not from the father. The chief original defender of this doctrine was the great English physiologist William Harvey. He made a great number of experiments, which are related in his work on Generation. The results of these confirmed in him the belief that all animals are derived from ova, which are more or less perfect, being most so in birds.

The semen of the male is regarded, in his view, as only the stimulus which provokes the ovum to commence its growth, and not as furnishing any particle of matter to the constitution of the new animal. He never observed the changes that occur in the ovary,

and did not, therefore, suspect the ovarian vesicle to be the seat of the animal germ. This was shown to be the case at a later period; but as he had often seen the beginnings of a conception in the uteri of animals he examined and as he had noticed the similarity of that ovum to the eggs of birds, he took it for granted that it was an egg, and declared that all beings are derived from ova.

This is the doctrine which is denominated more properly Evolution, and which has been carried to a great length by Haller, Bonet, Spallanzani, &c.

The same Regnier de Graaf whom I have already mentioned several times, was the first to find that the generative processes were attended with certain changes in the ovaries; that the small vesicles contained in them assumed a yellowish colour; and as he, on a careful search soon after copulation, several times found some of those bodies in the Fallopian tubes of the animals on which his experiments were made, he concluded they were eggs passing down through those oviducts to the womb, in order to undergo in that organ their full and final development. Nicholas Steno, Swammerdam, and Van Horn assert that they all saw them before De Graaf.

A different question now presented itself. Suppose that man, and all animals and vegetables are really derived from ova; are we to conceive of these ova as produced by a mere epigenesis, a begetting or formation of an animal upon and from the matter of another animal? Does the new animal's existence date from the moment of conception, or did its faint but real lineaments exist previously to that act of conception in the germ, as it lay concealed in the maternal ovary? How can a new, living, sentient being issue from the apposition of mere material molecules, confused and amorphous? Can dead matter beget living? It is as well to say at once that all generation is equivocal—that animal forms and properties may evolve themselves from fortuitous combinations of matter. That is very difficult to believe. Such a combination would be as apt to result in the production of a lion or an ape, as of a human being; but we find that

women bring forth human children, cows bring forth calves and not colts. There must be therefore—there is—some predetermined form, some mould, in which the new animal will be cast, and its elements arrange themselves. The germ must have existed as long as the mother who bore it; since her organs are manifestly incapable of secreting a perfect and complicated creature made up of such vast variety of tissues and organs.

Going thus far, we are compelled to go still further, and to admit that if the mother is incapable of forming the germ, that germ is, a fortiori, incapable of the same creative act; and so we mount upwards to the original creation, when all the germs that are now, or have been, or shall hereafter be in existence, were delivered, complete in all their essential attributes, out of the hands of the Creator of the universe.

Passing by the consideration of the minor authorities upon this strange topic, I shall proceed to lay before the reader the sentiments of the ingenious Spallanzani; whose experiments upon impregnation so far outstripped, for curious research, indefatigable patience and scrupulous accuracy, all that had been previously attempted upon this subject, that he justly stands at the head of this department of obstetric physiology.

Spallanzani's work is entitled, *Experiences pour servir à l'Histoire de la Generation des Animaux et des Plantes*, and was edited by John Sennebier, Minister of the Holy Gospel, and Librarian to the Republic of Geneva. Geneva, 1785.

These experiments were made on frogs, toads and salamanders. These animals (the females) have ovaria, and a uterus. The ovaria are replete with eggs, which are easily discovered on opening a female frog. If the animal be examined early after the sexual intercourse has commenced, the eggs or ova will be found in the ovaries; if at a later period, some will be found to have passed down the oviducts to the uterus. In the sexual act, the male places himself on the back of the female, and embraces her with his fore feet under the axillæ, so firmly as to hold on while she hops from place to place, and sometimes to kill her by the violence with which he presses

her sides. He has no penis ; but he is possessed of a small organ which protrudes a little, and from which issues a seminal fluid, that does not enter the organ of the female, but only bedews or is sprinkled upon the string of ova, as they issue from her body.

Eggs which are touched by this fluid are found to be fecundated, and if deposited in proper places, become tadpoles, which are soon after changed into frogs. Those eggs, however, which pass out of the female's body while the frog is prevented from sprinkling them with his semen, are not fecundated, but they soon putrefy and are wholly lost, or blasted.

Spallanzani often opened the female frog and took out of her uterus the unimpregnated ova ; but they always perished, no matter how carefully he managed them, unless he sprinkled them with the frog's semen.

He managed to collect the semen from the male frogs, and with a fine brush dipped in it, put it upon the ova : all such ova were as effectually fecundated as if it had been done by the male animal itself ; and in this manner ample opportunity was gained of testing the powers of that secretion.

If unfecundated ova were put into a vessel of water without having the brush applied to them, no tadpoles were hatched ; but if a part of the same string of ova were put into another vase, the brush being previously applied, Spallanzani had soon a large brood of young tadpoles.

By carefully observing these frog's eggs with glasses, and watching their progress, he afterwards found that they were not really eggs, but really tadpoles packed up in a globular form, and capable, after fecundation, of bursting the sort of amniotic membrane in which they were enclosed. Those within the body, and before fecundation, were exactly like those out of the body shortly after the male semen had been applied, or after they had been fecundated ; with the sole exception, that they would not grow and hatch.

What do these experiments prove, if the tadpole is really formed before it descends into the uterus, and only receives the aspersion from the male after it leaves the

mother? Do they not prove that the mother is the source whence they are wholly derived, and that the father only performs a subsidiary act in the matter?

Do they not prove that the germ of the fœtus existed before the father had any thing to do with the begetting of the tadpoles? Unquestionably they do.

Lest any one should suspect, after all this, that the spermatic animalcules might some how get into the ova and there become tadpoles, Spallanzani declares that he used the semen after in vain carefully looking in it for animalcules with a microscope. There were no worms in it at all, and nevertheless it was prolific; so that the idea of spermatic worms being necessary to render the semen prolific, is wholly refuted.

He used the greatest care in excluding the animalcules from the semen he wished to employ; he even mixed wine and vinegar with the liquid, but it fecundated the ova nevertheless. He put a few grains into eighteen ounces of water; a drop of this weak solution was nevertheless effectual; and even old semen, collected from the seminal vesicles some time after death, was also efficient.

The experiments of Spallanzani were thought so complete and decisive, as to establish the doctrine of a pre-existent germ, which was only evolved by the act of generation.

If you open a hen's egg and separate the yelk from the white, you will find on the surface of the yelk a small spot called the cicatricula. This small white spot exists in the eggs of pullets that have never admitted the male bird: a pullet's egg is an unfecundated egg. Well! this cicatricula, in a fecundated egg, begins to grow very soon after the warmth of the incubating hen has penetrated all parts of it; a vascular circle soon forms round it on the membrane of the yelk, and increases until the chick is completely formed. Before the chick leaves its shell, the yelk that remains, with its membrane, is taken up into the body of the young and serves to nourish it. It is proved that the membrane of the yelk is continuous with one of the young bird's intestines, and that the yelk is carried through it into the bowel, there to be acted upon by the digestive powers.

Now as this yolk, and this membrane which is continuous with the organs of the chick, exist before fecundation, are we not clearly warranted in believing that the lineaments of the embryo actually exist within the egg anterior to and independent of the male ?

Such is the opinion of all those who assert that germs pre-exist in the female, and that the sexual union does not bring it into existence, but only excites it—gives it propensity and power to grow.

There is a small insect called in French *puceron*, or vine-fretter, which has afforded a singular argument in favour of the doctrine of pre-existing germs. This insect is propagated by a generative union of the sexes ; but it is found that a female once impregnated, or having her ova fecundated, will at the same time have her posterity fecundated for nine generations : that is, her children will not require the approach of the male, nor her children's children to the ninth in lineal descent ; after that, however, the male must be admitted in order to fecundate anew. What answer shall we make to this argument, or rather this fact, if it be one ? Does it irrefragably prove that nine generations were boxed up one within another, and that the whole series of eggs were fecundated by a single copulative act ?

But what is the use of supposing a pre-existent germ ? This is the use. It is thought to obviate the difficulty arising from the circumstance that mere matter cannot create an organized body ; that there must be some creative or impulsive power—some bud, seed, or germ derived from the hand of God himself ; and hence the incredible theory has been published and supported by elaborate writings, that the whole human family, all the mammalia, birds, fishes, insects, plants, whatever lives or has being on our globe, was originally encased within the ovarium of an original mother of each species ; and that each undeveloped ovum or seed—among the countless multitudes of the wheat and grass fields, the innumerable spawn of fishes, and incalculable variety of insects—was not only created at the original creation, but that each one of these contains, in this nineteenth century, germs enough to supply the globe again and

again, if their several species could become extinct and lost save one pair. A plant that is crushed under the feet of an ox, an egg that is broken, a child that dies in infancy, a human abortion, involve, therefore, the destruction of innumerable entities, which God has created only to permit them to be destroyed. Does this sentiment comport with that tender care which is over all his works? Is it reverential to God to accuse him of sporting thus with his creative power, and using his foreknowledge, his benevolence and his wisdom without object, aim or end?

It is pretended that the use of this doctrine, as I said just now, is to explain the origin of organic bodies. But does it explain that difficulty? No; it only removes it one step off, and presents a greater. Besides, if, as we often see is the case—if nature is capable of reproducing organic parts of animals, there is no greater exercise of power required for reproducing all the organic parts of an animal. A lobster, that loses its claw, is not long in reproducing a claw provided with the same muscles, absorbents and tissues as were in the original member. Here, then, by a sort of extension or real propagation of the constructive power, a *nisus formativus*, in short, a new organic part is composed. Wherefore, may we not suppose that the same power in the female organs may, by its simple extension or propagation, lay the foundations of a brain, a heart, an alimentary canal, and indeed a whole body? If it be said, in objection, that the lobster's claw grows from a germ, I must decline admitting the objection, inasmuch as the model of the claw being lost, there remains no germ, no mould, no predetermined form by which its growth could be fashioned, or its dimensions limited and restrained. A *biceps muscle* is no mould or germ for a *pronator quadratus*, nor is a *triceps* the model of a *palmaris*.

The doctrine of the evolution of pre-existing germs, encased or *emboîtées* one within another, does not remove any one difficulty. Does it explain the difference of sexes? Can we reconcile it with the resemblance of children to their parents, in physical form and propensities, or in intellectual and moral character? Why should a black man beget a woolly-headed *fœtus* upon the ovule

of a white female? or why should a mule hybrid be the result of the union of the ass and the horse? If the germ were white, how does it acquire the black rete mucosum? or how, in the second case mentioned, shall we explain the imperfect development of the genital organs? If they are really formed upon a mould pre-existent and derived from the hand of the Creator at the origin of the world, why does it deviate, and yield a result which that Creator had not intended or foreseen?

Let us now recapitulate.

The ancients believed that the seminal liquors of the male and female united in the womb, are gradually converted into the living organized embryo.

Leewenhoeck taught that the spermatic worms, or seminal animalcules, are the germina of men, women, birds, beasts and creeping things.

Spallanzani and Bonet tell us that we are all six thousand years old, having been packed up from the beginning of time, like so many pill boxes or crucibles, one within another.

Buffon, as I have already said, considered the world to be replete with organic particles, &c.

There are many living philosophers, and innumerable dead ones, who have supposed that all nature is filled with vital organic molecules or particles, which require only certain accessory circumstances to enable them to germinate and coalesce with the organic forms of animated beings. On the subject of generation these are neither evolutionists nor epigenesists; they are panspermians; their doctrine is called panspermy. Blumenbach is not a panspermian; Buffon is. I do not know whether any of my readers are likely to take up that faith. If they think, with me, mere matter is brute, dead, inert; if they think that a plant may exist on distilled water composed of oxygen and hydrogen, and that it can absorb its carbon from the air, and procure its other chemical constituents somehow else: they will think also that that plant can convert dead matter to living, and then become food for man.

All flesh is grass, and all grass can make its vital particles for its own use; it does not find them ready at

hand. *I* reject the panspermy; *I* profess to have no fixed notions on the subject of reproduction, which, like other vital forces, possesses a sort of metaphysical subtlety which is too subtle for the comprehension of finite minds. *I* have thought it needful, however, to say what *I* have already said, as it is a part and parcel of the subject of Midwifery, and has a just claim to constitute a portion of every general sketch of that branch of medical contemplations.

The Germ existing in the ovarium, and which has already been spoken of under the title of the Ovarian, or Graafian vesicle, becomes fecundated, as the first act in the series of changes that occur in Pregnancy.

In consequence of the fecundation of a germ, it is removed, by unknown processes, from its gangue in the ovary, and conducted along the canal of the Fallopian tube into the cavity of the womb. It is, like a seed, removed from its native pericarp, and planted in a favourable soil, where its new growth is to commence, and continue until the attainment of all the qualities requisite for its independent existence.

The fecundated ovule is, in one sense, an independent organ. It imbibes, from the vital surfaces with which it is in communication, the elements of its augmentation, and makes rapid progress in growth and vigour.

At the time the act of fecundation takes place, or soon afterwards, the inner surface of the womb undergoes a change, which causes it to be covered with a deposit of plastic lymph, or albuminous matter, which adheres to every part of the inner paries. This deposit has been likened to a coat of white paint plastered over the mucous lining. It might be better compared to the inflammatory exudation of croup, or to those white crusts that are found to line the soft palate and arches in some anginas. Be this as it may, when the small Graafian vesicle reaches the uterine extremity of the Fallopian tube, it finds the orifice closed by this material, which it pushes away as it advances, and at length gets within the ute-

rine cavity ; one of its hemispheres resting in contact with the naked surface of the womb, while the other is still resisted by the new deposit which it had thrust away before it as it came into the cavity : it is thus placed betwixt the womb and the deposit. As this new deposit is a mere exudation, intended to subserve only temporary purposes, and to be discharged when those purposes have been fulfilled, it is properly called the deciduous coat, or caducous coat. But the ovule thrusts the caduca away before it, turns it back, reflects it ; and, on that account, the decidua has two appellations : 1. *Decidua vera*, meaning all that part that remains in contact with the womb ; and 2. *Decidua reflexa*, or all that part which is reflected or pushed away by the advancing ovule. When the ovule arrives, it is not so big as a pea ; but the cavity of the womb is much greater. The decidua reflexa, which closely covers the ovule, is just large enough to cover it or enclose it ; but the decidua vera is as large as the whole uterine cavity. In process of time the ovule is found to have grown large enough to fill up the whole cavity of the womb ; and as it always carries the reflected part of the decidua with it, it follows that the decidua reflexa and the decidua vera come, at last, to be brought into close contact, and by the continued pressure of the womb, are finally so united or fused together, as to be inseparable and indistinguishable from each other.

While the decidua reflexa is thus rapidly increasing in size, *pari passu* with the enlargement of the ovum, the space betwixt the two deciduæ is not void ; it is filled with a substance resembling white of egg, contained in a delicate hyaloid membranous network. This substance entirely disappears before the fifth month of gestation. It is scarcely necessary to repeat here, that as the uterine surface is covered with decidua, menstruation does not take place, and that there is a suspension of that function during a pregnancy.

The ovule, upon entering the uterine cavity, consists of an outer membrane, the chorion, which encloses the inner membrane called the amnion, within which is the liquor amnii, and the embryo, connected with the amnion by its cord, or navel string. For the most part

the ovule attaches itself to the naked surface of the womb in the vicinity of the orifice of the Fallopian tube through which it entered : but it certainly does, in a good many instances, move to the fundus, or to the anterior, or the posterior surface of the organ ; or it may even fall downwards into the vicinity of the upper opening of the cervix, and attach itself there ; but wherever it happens to fix itself, there is the seat of the placenta, and from that point does the decidua reflexa begin to encroach upon the cavity of the decidua vera.

It is asserted by some, and denied by other writers, that the outer membrane is covered with villi from the first moment of its arrival in the uterine cavity. Without attempting to settle this question, for which I am by no means prepared, it is sufficient to state, that at the end of the fourth or sixth week, the entire surface of the chorion is furnished with numerous villi or spongioles, and that these villi are the means by which the ovule attaches itself to the living surface, and that they ultimately are converted into a placenta. The placenta is, therefore, a production of the chorion. It comes off with the chorion, and is utterly inseparable from it except by rupture. No part of it is supplied by the womb. When the ovum is expelled, whether by abortion, by premature labour, or at full term, the placenta is separated from that organ, and leaves nothing adherent to it. It is simply set upon the surface, and may be at any time peeled off without the slightest difficulty. The skin of a ripe orange does not peel from the fruit more easily than the placenta from the womb, at all periods of gestation.

Admitting that those villi of the chorion that are in contact with the naked surface of the womb, are finally converted into placenta ; then the whole of the villi that are in contact with the decidua reflexa never form any union with that substance ; the necessity for their existence ceases, and they slowly disappear, until the chorion, where they covered it, becomes a smooth shining membrane. I have seen several specimens of the ovum discharged whole at three and at four months ; and in such cases I have always found the placental part of the chorion

strongly expressed, while the remainder of the membrane resembled an egg from which the shell had been carefully removed, or one on which the shell is not yet deposited.

M. Velpeau remarks that the portion of the spongy surface of the chorion which continues in contact with the living surface of the uterus, becomes the seat of a very active nutrition ; the spongioles enlarge, and among them soon appear the blood vessels which are shot forth by the umbilical vessels of the child. It seems now to be generally agreed that the spongioles of the chorion are not blood vessels, but merely a sort of areolæ, subserving the purposes of nutritive absorption, up to the period when the forces of the embryo acquire a certain degree of development.

Inside of the chorion is found the membrane denominated the amnion. It is not, in the early stages of pregnancy, near so large as the chorion, which, indeed, it touches only at one point. There is found betwixt the two membranes a sort of vitreous humour, or fluid, contained in a delicate network, which is gradually removed, by some unknown process, as the amnion becomes larger, until at length, when it (the amnion) becomes large enough to fill the cavity of the chorion completely, this vitreous humour or reticulated body is no longer to be found.

Up to the end of the third month, and in some instances to a later period, the embryo or fœtus is supplied, not only by what the vessels of the ovum absorb from the living surface of the womb, but also by the contents of the umbilical vesicle, which is a small sac as large as a pea, lying between the chorion and amnion, and connected by a stem, or channel, or duct, with the umbilicus of the child. This vesicle, or sac, is filled with a substance not unlike the yelk of eggs, which can pass along the duct above mentioned through the umbilicus and into the fœtal intestine : an arrangement analogous to that of the chick in ovo, in which the membrane of the yelk is known to have a direct connection with the intestine of the chick, into the cavity of which the substance of the yelk passes freely, about the time it is hatched.

If the student now reflects that the umbilical cord of

the child, at term, is from twenty-five to thirty inches in length, and covered with a coat of amnion all the way to the navel, it seems to me that he will readily infer that the germ of the infant must have been originally situated betwixt the chorion and amnion; and as it removes further and further from the chorion, it carries with it a reflection of the amnion, which to the latest period lines its umbilical cord: whereas it leaves its accessory organ of nutrition, to wit, the umbilical vesicle, betwixt the two membranes, and only carries along with it the duct or tube, which elongates proportionably with the umbilical cord.

In regard to the existence of the allantois, I shall refer the reader to what M. Velpeau has said upon that head; because the subject being as yet imperfectly understood, I do not think this a fitting occasion to speak of it more at large. Under that head, however, I doubt not that all that can as yet be properly said, has been clearly exposed by that most ingenious and accurate writer.

Within the amnion is contained a quantity of fluid denominated the water of the amnion, or in common language *the waters*; it is never perfectly transparent, but has a milky appearance, not unlike that presented by a dilute mixture of buttermilk and water. Many flocculi are found in this liquid, which doubtless consist of coagulated albumen; a small quantity of salts are also found in it. The source from whence it is derived is wholly unknown. The quantity varies in different individuals, amounting in some to three or four pints, and in others to not more than a few ounces. It serves to protect the fœtus from the injurious succussions and shocks to which it would be liable but for the presence of the fluid, which serves as an elastic nidus or medium in which it grows.

The womb increases *pari passu* with the ovum, and ceases to increase, and indeed begins to diminish in size, or to contract, whenever the water is drawn off or allowed to escape. I think that, whatever is the principle of vital mechanism by which the liquor amnii is introduced into that sac the amnion, no one can justly entertain the smallest doubt that it serves as a principal antagonist to that force which prompts the uterus al-

ways to contract ; and hence this antagonizing use of the liquor amnii is to be assumed as *one* of its chief ends. It can in no manner serve for the nutrition of the child, for it exists at a period when no such function can be supposed of it ; and even in astomatous or acephalous children, and in such as are born with imperforate œsophagus, the liquor amnii presents its usual phenomena, while the child itself is as amply nourished as if it were possessed of the most perfect conformation.

The child turns freely in the cavity of the womb in the early stages of pregnancy. Its cord is then very short, and attached much nearer to the breech than to the head of the embryo, which hangs in the waters by the cord, as a pear by its stem ; whence the head, being the heaviest and largest end of the lever, falls lowest, so that when the child is to be born, it generally advances with the head first. Its proper situation throughout the entire pregnancy is with the head downwards, the breech being turned towards the fundus uteri. Some cases, however, occur in which the pelvic extremity of the child advances first ; and we are bound to believe, when such instances do occur, that the child has been in that attitude during all the latter months of the gestation. It is a very singular fact, and worthy of remark, that some women are met with who bring all their children into the world by breech presentations. A lady assured me that she had had five of her children born in this way, which were all she had borne.

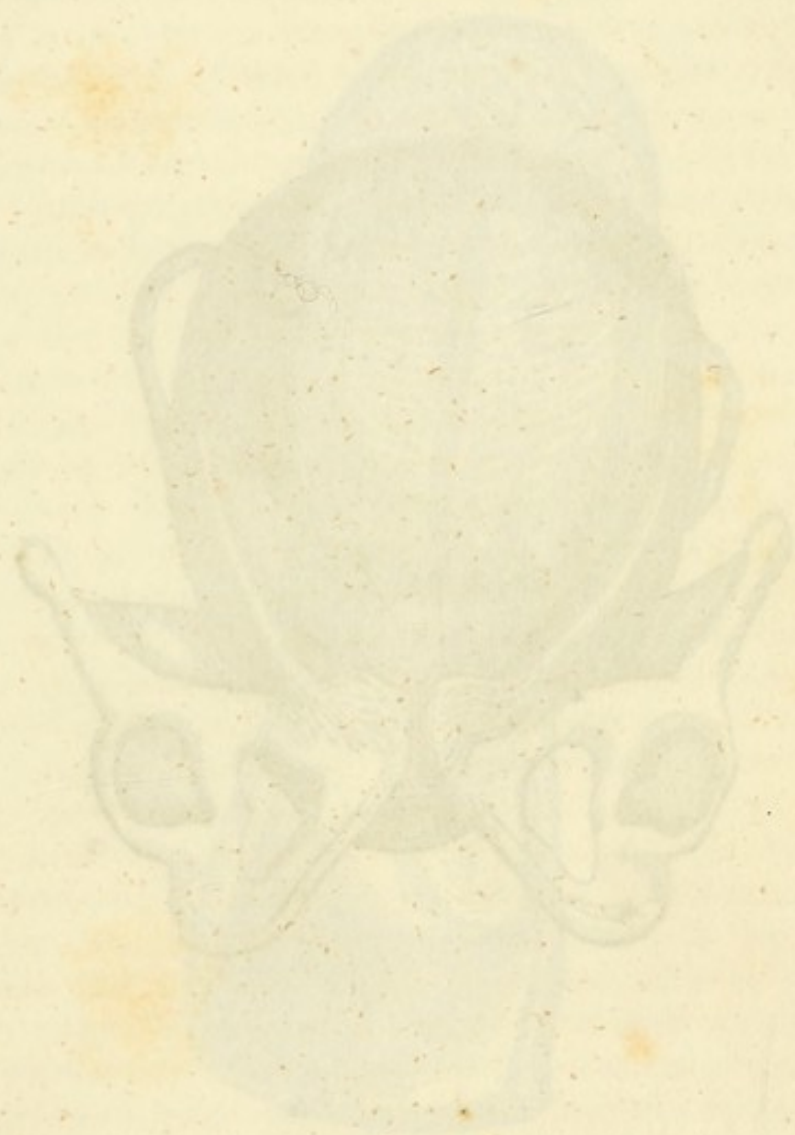
I see not how such a case can be accounted for, except under the supposition that they were all accidentally so placed ; for nothing in her structure, or that of her infants could be discovered as likely to cause such a succession of untoward presentations. It is certainly possible that the child may be, without extrinsic aid, occasionally turned in the womb at a late period of pregnancy, but such an occurrence has very rarely been met with. Up to the fifth month, such mutations could take place without difficulty ; but when the child has attained a greater size, it is not at all likely to happen. The observation of an immense number of obstetric cases in France, shows that about one child in twenty-eight is

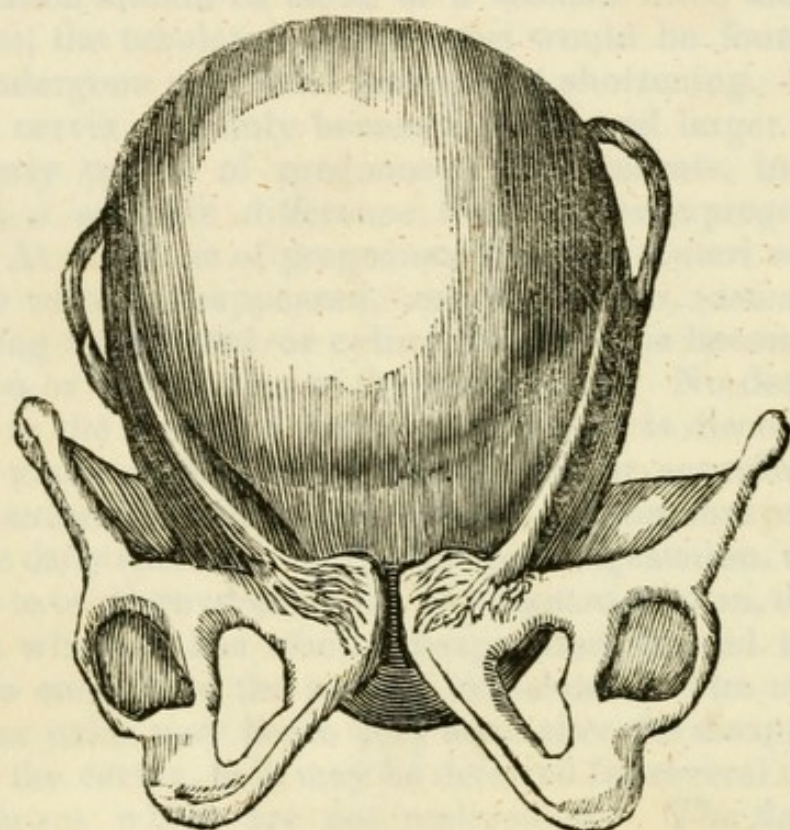
born by the breech presentation, while the head presentations were twenty thousand six hundred and ninety-eight, out of twenty-two thousand two hundred and forty-three cases.

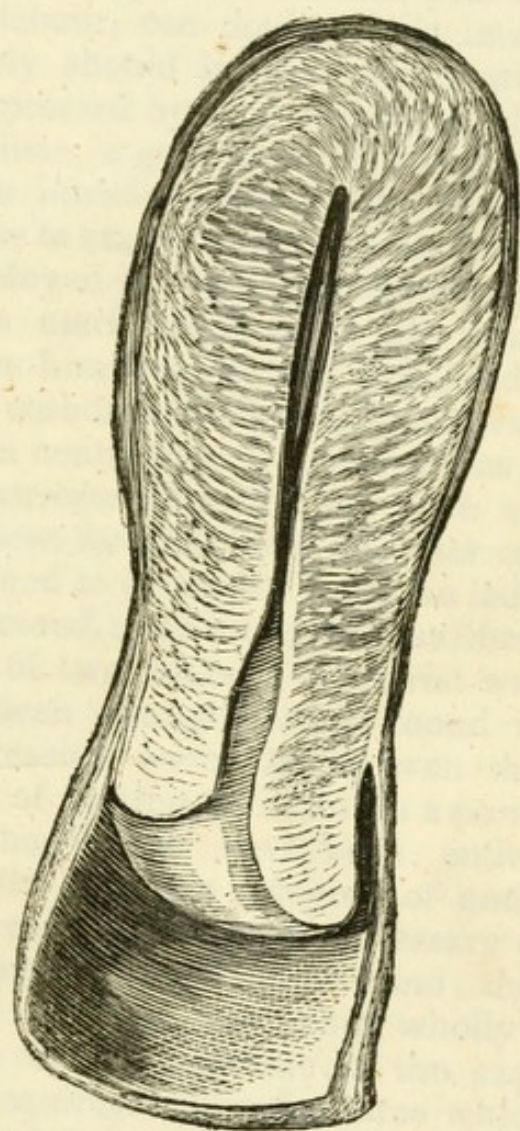
As the ovum expands, it carries the uterus along with it, making use of the cavity of the fundus and body of the organ at first, and only distending the *upper* part of the cervix in the first months of pregnancy, so that if an examination should be made of a woman three months pregnant, the tubulated cervix uteri would be found to have undergone very little perceptible shortening.

The cervix certainly becomes fuller and larger at a very early period of pregnancy, and presents, in this respect, a sensible difference from its unimpregnated state. At the close of pregnancy the cervix uteri seems to have wholly disappeared, and the womb, instead of exhibiting a tubulated or cylindrical neck, is become an oval, the os tinæ being at the lowest end. No decided change in the length of the cylindrical part is discovered by the touch until after the fifth month, or according to certain authorities the seventh month. From that period it grows daily shorter, until the last days of gestation, when it is not to be discovered at all. A pregnant woman, therefore, in whom it has wholly disappeared, is said to be ready to commence the process of labour. The attack of labour pains may begin very soon after the disappearance of the cervix, or it may be deferred for several days, from causes which are not understood. *The figures exhibit the form of the gravid uterus; which may be compared with that of the unimpregnated organ.*

In all instances that have fallen under my notice, the thickness of the walls of the womb, when at term, has been rather less than in the non gravid organ. The tissue is much looser and easier to cut, and yields to any distending force far more readily in the gravid, than in the non gravid state. It is incomparably more vascular, so that in the last weeks of gestation it may be compared to a purse, or network of blood vessels, with an abundance of loose cellular tissue and muscular fibres interspersed. The uterine arteries and veins which reach the womb near its lower extremity inosculate









freely with the ovarian or spermatic vessels, that enter its texture betwixt the folds of the broad ligaments, and supply the ovaria, the Fallopian tubes and upper portions of the womb.

With regard to the muscular structure of the womb, I shall remark that no person who has witnessed the exercise of it in labour, can doubt of its immense power, and particularly should he have felt it while the hand has been compressed by it in turning a child in utero. Some years since, a gentleman of this city, found himself obliged to introduce his hand completely into the womb, in order to extract a retained placenta. While the hand was employed in separating the afterbirth from the uterus, the os uteri closed upon his wrist with such force as to give him very severe pain, and he found it impossible to withdraw the hand, which was completely fastened by the contraction. After various unsuccessful attempts to extricate himself from such an unheard of difficulty, he sent for a bleeder, and after causing a large quantity of blood to be drawn from the lady, the spasm of the cervix ceased, upon which he was liberated from an imprisonment of two hours. His wrist was marked as if a cord had been strongly bound round it, the traces of which impression were visible even the next day. The operation of turning the child, in a powerful womb, from which the waters have been entirely drained, not unfrequently produces a degree of numbness, from pressure, so great as to make it necessary to withdraw the one and introduce the other hand; the sensibility and motion of the first one being wholly suspended. The resistance to be overcome in the expulsion of a grown fœtus, requires a muscular force which cannot be exactly estimated, but which must be very great.

Different writers describe the arrangement of the muscular fibres of the uterus in different manners. The very discrepancies of these authors ought to convince us that the arrangement is not well understood; and indeed it is of no great consequence, in a practical view, that they should be demonstrated. It is enough to know that they are so arranged as to tend, by their combined contractions, to reduce the uterus back from the gravid size

to that of the unimpregnated organ. When their contraction is co-ordinate, the fundus tends to approach the os tinæ, and the sides tend to approach each other. Whatever is contained within the cavity of the organ is, under these circumstances, expelled therefrom.

Labour does not, however, always proceed with regularity. The muscular power of the womb is occasionally found to be morbidly exercised. Those fibres which tend to bring the fundus near the os tinæ, sometimes fail to act, or act imperfectly, while those that tend to approximate the sides of the womb, act with such force as to compress the body of the fœtus, and instead of expelling it, rather confine and retain it within the cavity. We frequently observe women to suffer under the most violent uterine pains, which nevertheless do not move the child downwards in the least degree: such pains should be suppressed, if possible, in order to admit of the co-ordinate and regular operation of all the fibres being restored, after a temporary cessation or repose. It is such an action as this which constitutes the hour-glass contraction of the womb, whereby the placenta is occasionally retained, instead of being naturally extruded; a case of much difficulty, embarrassment and even danger.

As the ovum increases in size, the womb augments proportionably. It becomes too large to occupy the pelvic excavation, and then rises into the abdomen. The pelvic cavity is four inches by five in diameter; the womb, at term, is from seven to eight inches in transverse, by twelve inches in longitudinal diameter. It rises out of the pelvis at the fourth month, or at four and a half months, which is the period of Quickening. It has been contended that "quickening" is a sensation produced by the sudden escape of the globe of the womb from out of the pelvis; and the intrusive organ is supposed to excite this curious sensation by its sudden entrance into the lower part of the abdomen. It will not be doubted that such a case might occur, and produce by its very suddenness the agitation or fainting that is sometimes observed to accompany the first "quickening;" but it is far more common and natural for the fundus

uteri to come slowly upwards and take its place in the hypogastrium, without causing any agitation or disorder whatever. In such a case, the quickening will be perceived as soon as the child acquires muscular power sufficient to make itself felt by the mother, whenever it forcibly extends any one of its members against the inner surface of the womb. This takes place from the end of the sixteenth to the end of the eighteenth week, some being earlier and some later.

Upon examining a pregnant woman per vaginam, at the second or third month, she will be found to have the os uteri somewhat depressed, or prolapsed towards the orifice of the vagina, and this to such a degree as to cause her to complain of symptoms of a falling of the womb. After the quickening has taken place, these symptoms disappear, and, upon examination, now repeated, the os uteri is discovered to be very high up, and generally directed towards the promontory of the sacrum, or at least towards the upper part of the curve of that bone. As the longitudinal axis of the womb ascends in the direction of the axis of the superior strait, the reader perceives that the anterior face of the lower portion of the womb must rest on the pubis, while the body of the uterus lies upon the peritoneal covering of the abdominal muscles: the bowels are behind the organ and above it.

Both the projection of the sacrum and the intrusion of the spinal column, tend to give to the womb an oblique direction, and hence we generally find it to be inclined towards one side of the abdomen. So far as my observation enables me to speak, it is oblique to the left more frequently than to the right side. Great degrees of obliquity are scarcely met with in first pregnancies, in consequence of the vigorous contractility of the abdominal muscles, which constrain the gravid womb to remain

in the mesian line ; whereas, in women who have borne many children, those muscles acquire such a laxity and want of tone, as to allow the womb to librate from side to side, or in front, according to the attitude of the patient for the time being. Of the effects of obliquity we shall speak when we shall come to treat of labour.

Women, in whom the abdominal muscles have not lost their tone by repeated extensions in pregnancy, will be found to compress the uterus strongly, in a direction towards the back ; whereas those whose abdominal muscles have become weakened by repeated gestations, carry the child very low, to use a common term, allowing the enlarged womb to recline upon the muscles in front of it. In the former case, the pressure of the organ against the spine must, to a greater or less degree, interfere with the current of blood in the great vessels of the abdomen ; hence the aorta and iliac arteries, and some of their branches, will pass on their contents with less freedom than is common, whereby the upper parts of the body are supplied with more than their due proportion of the blood. Headach, vertigo, flushings of the face, and tendency to paralysis and convulsions, may very properly be attributed to the excessive momentum of the blood, distributed to the superior parts, and determined towards them by this cause. Sighing, præcordial distress, dyspnœa and coughs are also found to depend upon the same principle, and are to be treated with a view to lessen this vicious distribution and accumulation of the vital fluids. Venesection, looseness of the bowels, light diet, and whatever tends to produce moderate relaxation of the muscular forces, are in general employed with signal success in these circumstances.

I have frequently met with coughs in the latter weeks of pregnancy, which proved rebellious against all treatment, until the delivery of the patient, after which they yielded to the common means of cure : the pressure of the womb on the abdominal vessels being removed,

the pulmonary irritations previously sustained and enforced thereby, proved no longer indomitable.

The same pressure of the enlarged womb, above spoken of, interrupts the return of the blood from the extremities, and the transit of the contents of the lymphatic absorbents. Hence, when that pressure has reached its maximum, the feet and legs become œdematous or anasarcaous; the veins of the feet and legs acquire an enormous size, and become permanently varicose, and in certain instances burst, so as to cause effusions of blood to take place. In like manner as has been stated of the superior or arterial engorgements, this inferior or venous engorgement ceases upon the abstraction of its cause. Limbs when swelled even enormously, are observed to recover their natural size in three or four days after the accouchement. The same general plan of treatment is applicable to both the cases; but it is particularly incumbent upon the medical attendant to employ, in the latter case, rollers for the limbs, that may enable their vessels to overcome the distending causes. Where the œdema is very great and painful, punctures with a lancet, extending into the tela cellulosa, allow the serum to escape, and thereby are the means of procuring very great relief, without the least danger, or any inconvenience worthy of attention.

In some cases the œdema of the limb is so great, that it extends, at length, even to the perineum, the labia and the lower part of the abdomen. I have met with instances in which each labium was swollen to four or five times its natural size, from this serous infiltration. In some of these cases the tumour has been hard and very resisting. I found it necessary on that account to puncture them, in order to admit of the reduction of the size, before the child could pass forth of them; but, for the most part, such punctures are not required, since the pressure of the advancing presentation suffices to compel the serum to flow out of the labia and perineum into collateral cells of the tela cellulosa.

The placenta, the cord, and the membranes, constitute what is called the afterbirth, or secundines. It is commonly supposed and taught, in this country, upon the authority of Mr Hunter, that the placenta is an organ composed of two distinct parts, one derived from the mother and the other belonging to the fœtus : that the maternal part is formed out of the decidua, and the fœtal part out of the vessels of the umbilicus : that the blood-vessels of the mother pass freely into the maternal part, and pour their sanguine fluid into certain cells contained in it, while the vessels of the fœtal umbilicus either pump up this fluid and take it to the embryo, or at least derive from this blood some oxygen, or deposit there some carbon, so as to effect here the office which, after birth, is performed by the lungs. Mr Hunter's authority in physiology and anatomy is so justly venerated, that it may seem arrogant in any one to venture to differ from him ; but nevertheless I cannot agree with this view of the fœtal state. Having adopted other views, I shall proceed, as follows, to lay them before the reader, leaving him to adopt or reject them upon his own judgment.

The child is connected with the mother by means of the Placenta, which should be regarded as the capillary portion of that system of blood-vessels which is projected from the body of the embryo, in order to establish its union with the parent. The placenta is a production of the outer surface of the chorion, or, I might say, it is a thickened portion of the chorion, of which it is part and parcel, and from which it can never be separated, except by violence. At full term, this substance, the placenta, is from seventeen to twenty inches in circumference, and above half an inch in thickness, at its thickest part. It is attached to the uterine surface by a moderate adhesion, except in a few rare instances, in which the union is more intimate ; but on all such occasions, the attachment ought to be considered as morbid, or unnatural.

I have seen a womb, containing a fœtus at full term, taken from the body of the mother not long after her decease. The uterus was laid open by an incision ex-

tending from the fundus to near the os uteri; this cut exposed the chorion: the cut edge of the womb being now turned back from the chorion, parted from it without the least difficulty. Upon continuing to peel the uterus off from the chorion, the thin edge of the placenta came into sight; and as soon as it was seen, the greatest pains were taken to separate the womb from the afterbirth slowly and gently; and upon the most careful observation, with the eyes directed to the line where the separation was taking place, not a single blood-vessel was discovered passing from the placenta to the womb, or from the womb to the placenta. The slightest force only was required to effect the detachment, and the adhesion was not near so firm as is often observed betwixt the skin and a good adhesive plaster. When the detachment was completed, nothing was left adherent to the womb, and no projecting ends of broken blood-vessels were to be found, nor any effusion of blood or serum. The patient had died only a few hours before. The uterine face of the placenta was left smooth, and so was that of the womb.

I have had more than one opportunity of witnessing this detachment, under the most careful attention and anxious desire to discern with the eye, any traces of vascular connection of the two organs: I have not been able to discover any such thing. The evidence of my own senses, therefore, compels me to reject the opinion of a vascular anastomosis, or a continuous vascular union in the utero-placental structure. I am compelled to think that the afterbirth is merely adherent to the womb, and derives from that organ the material for the nutrition of the child, and the decarbonization of its blood, as well as the needful supply of oxygen.

I can never, I think, be persuaded that, if so strong a union as is contended for by Mr Hunter did exist, the uterus could, by its own contractions, peel the secundines off from its surface; nor that I could, as I have many times done, detach it with my fingers, introduced into the uterus in cases of a morbid retention of the substance in question. I have already said that the skin of a ripe orange does not more easily part from the fruit,

by peeling, than the placenta parts from the surface to which it is naturally attached. I leave it to the intelligent reader to decide, supposing my statement to be correct, whether such tissues as arteries, and veins, and capillary vessels, which it is pretended pass freely from one to the other of these organs, could be broken off with such slight force; and I might further, in support of this view of the subject, ask wherefore such a strong vascular union in the human female, when it is admitted that none exists in the other mammalia? The mechanical or structural principle by which the embryo is nourished must be the same in all orders of the mammalia, and few persons pretend that there is vascular union of the placentulæ and cotyledons in the pecora, in the zone-like placenta of the genus felis, in the placentula of the rat, &c.

Let the reader, who wishes to satisfy his mind upon this subject, take an opportunity to examine the gravid uterus of the cow, the sheep, the cat, the rat, the mare, &c., and he will immediately perceive, that although these animals bring their young to perfection as well as the human female, they certainly do not furnish the least evidence of a vascular union, or of any thing more than a moderately firm adhesion of the placental part of the ovum to the gestative organ; and nature is too simple and economical in the use of her means or laws, to deviate in one of the mammalia, from a principle which is of universal application in the remaining genera.

From the foregoing remarks, the student will perceive that I desire to inculcate the opinion that there is no uterine part of the placenta; that it is altogether foetal; and that, whether it be separated in the second month or at the end of the ninth, or at any intermediate stage of pregnancy, the whole ovum, the entire product of conception comes off, and leaves the womb absolutely empty, bringing with it nothing that belongs to the womb.

I am well aware that this opinion is not in accordance with that of Mr Hunter, nor that of many of my medical friends here, but I cannot, however strongly I might desire to agree, upon these facts, with those whose views are entitled to my highest respect—I cannot forego the

convictions that I have formed from observations made with my own eyes, and which are also supported and enforced by such a writer as M. Velpeau, whose accuracy and candour give him claims to credence, on this point, not less in degree than is due to any writer of ancient or modern times.

Should I be asked wherefore the uterus bleeds so violently when the placenta is separated from it, and whether such large effusions of blood could be expected to take place were there no ruptured vessels in the case of such detachment, I have this answer, that the uterus is, in the gravid state, a highly vascular and sanguine organ; that it has a natural proneness to hemorrhagic irritations, and that it bleeds as easily as, but scarcely more readily than the Schneiderian membrane, whenever it is the seat of an hemorrhagic irritation; and that as we do not attribute to the common epistaxis, even when most profuse, a traumatic character, so we need not feel compelled to suppose a traumatic state in every instance of uterine hemorrhage in pregnancy. I might further answer that uterine hemorrhage often ceases upon the application of cold, the exhibition of sugar of lead, of alum, and other styptics, or upon venesection; and the same remedial results are obtained in epistaxis, hæmoptoe, or hæmatemesis. I am, therefore, not moved from my sentiment by the question supposed; but rather confirmed by the analogies that I can discover in other instances of effusion of blood. It is also very certain that the womb does not always bleed when the placenta is detached. I frequently have received an afterbirth which was not in the least soiled with blood. I once, in turning a child that presented by the shoulder, found the afterbirth wholly detached; I even took it in my hand while exploring the womb for the child's feet, and nevertheless, there was no hemorrhage. Upon one occasion I was invited by Dr Shaw of this city, to visit with him a patient who had a shoulder presentation. While his hand was in the uterus, and before he had found the feet, he said to me, "The placenta is entirely detached, and loose; I have it now in my hand." In that instance, also, there was no hemorrhage, and the child was delivered alive.

Now I am unable to comprehend, in the first place, how the placenta could be wholly detached in an uncontracted womb, if it were united by strong blood-vessels; and secondly, how it could fail to bleed profusely in either of the above mentioned cases, had there been any rupture of blood-vessels. Surely, if a multitude of vessels as large as crow-quills could have been broken off, the child being still in utero, they could not possibly have failed to furnish a large and dangerous effusion of blood. I shall, therefore, with great confidence continue to entertain the same sentiments I have long held upon the mode of connection of the womb and the ovum.

The placenta is scarcely more than a congeries of arteries, and veins, and capillaries, united in bunches, by means of a cellular tela. These bunches constitute certain lobules, which are not very visible until the placenta has been bent towards its foetal surface, so far as to break it, when they become apparent. Each lobe or lobule is united to the others by a common cellular union.

The use of the placenta is twofold: as, first, to afford a point of direct contact of the vascular circulation of the child with the living surface of the mother—and it should be here noted, that everywhere else, except at the placenta, the child has a chorion and amnion interposed betwixt it and the mother, so that if the child does absorb or imbibe the materials for its nutrition from its parent, this is the only point at which that acquisition can be made; and secondly, that the placenta serves as a branchia, or gills, a substitute for its yet undeveloped lungs, and that it excretes here its carbon, and receives its oxygen, without some apparatus for which, it would speedily die of asphyxia. In fact, we see children perish very speedily with asphyxia, whenever, in consequence of pressure on the cord, or total detachment of the secundines, they lose their only means of getting a supply of arterialized blood.

I am acquainted with no facts that are indisputably in evidence of the existence of any considerable absorbent vessels in the placenta or the cord; nevertheless, if the

child be in contact with its mother at no other point than that by which its placenta touches her, it must follow that the child does there absorb, imbibe, or in some manner acquire the means of its increment. There are authors who are disposed to take up again the exploded notion of an absorbing power in the veins: but it is far easier for me to believe that there may exist many short absorbents leading from the surfaces on which they open directly into the nearest veins, and on that account not yet distinguished from the veins by the art of the anatomist; than it is to admit that a vein, which is nothing more than a continuous artery or capillary vessel, should be endowed with the power of absorbing. It is true that many instances are recorded of injections having been thrown from the vessels of the mother into the vessels of the fœtus, and vice versa, and this is said to take place not only in the human female, but also in the case of other mammalia. Biancini informs us, for example, that by injecting the vessels of a woman, the placenta being still undetached, he found the matter of injection had penetrated the tortuous arteries of the womb—passed into the tissue of the placenta, and spread itself over the membranes. He also succeeded in injecting the veins of the fœtus in a cat, by filling the uterine arteries. In another experiment he threw an injection into the umbilical arteries of a calf, and found that it passed directly into the placenta, by nine short cylindrical branches, which he calls placento-uterine veins. These statements might be deemed sufficient to insure our assent, were it not that multitudes of other attempts have been in vain made to procure similar results, and that the supposed success of them can be accounted for on the hypothesis that rupture readily takes place in dead tissues, by which means fluids enter into routes from which they are wholly excluded during life.

I have, many times, counted the pulsations of the fœtal heart, in utero, by means of auscultation, and have found that pulse varying from one hundred and thirty to one hundred and forty beats per minute, while the mother's heart was pulsating at the ordinary rate. I take this

fact as at least a strong argument in favour of the opinion of those who regard the fœtus as an independent being, particularly if considered in conjunction with this other fact, viz. that the blood of the fœtus is always dark, like venous blood.

The placenta may be situated on any part of the uterine surface. It may be found upon the fundus, on one of the Fallopian orifices, on the bas-fond, in front, on either side, or upon the inner os uteri. In the latter situation great danger arises to the woman, inasmuch as the placenta must be detached wholly, or in part, before the os uteri can be opened sufficiently for the exit of the child: it is the much dreaded placenta prævia.

The blood reaches the placenta by the two arteries of the umbilical cord, and escapes by a single vein. Its route is as follows. The contraction of the left ventricle of the fœtal heart propels the wave of blood into the aorta, through which it flows, along the internal iliacs, the hypogastrics and the umbilicals, into the placenta; it enters there into the radicles of the umbilical vein, by which it is transferred along the cord to the navel. Upon re-entering the abdomen through the umbilical ring, it passes along the edge of the falciform ligament of the liver, and enters the vena portæ; across which a part of the current flows, in order to enter in at the ductus venosus, which empties it into one of the hepatic veins, or into the lower cava; the remainder of the current flows along with the portal blood into the hepatic vessels, and is taken up by the hepatic veins, to be cast into the common system of the cava, so that the whole of the placental blood which had been separated in the portæ, is reunited in the cava. In the cava it moves up to the right auricle, and passes directly through the septum auriculorum, by the foramen ovale, into the left auricle, and thence into the left ventricle, and so into the aorta again.

While the blood that comes from the placenta takes the route above mentioned, in company with the blood from the inferior extremities of the child, that part of the fœtal blood which has circulated in the head, the arms and upper parts of the body, is collected in the upper

cava, which also opens into the right auricle ; but this current is thrown across the auricle to the right ventricle, and does not mix with that from the lower cava, and which, as I just now said, passes directly from the cava to the left auricle. When the blood of the upper cava has thus reached the right ventricle, it is propelled into the pulmonary artery, and advances towards the lungs, into which a portion of it enters and returns by the pulmonary veins to the left auricle, and thence to the left ventricle ; but by far the larger portion does not enter the lungs at all, but is driven through the ductus arteriosus, which leads from the pulmonary artery into the aorta, to a point below where the carotid and subclavians are given off.

Under this arrangement it is evident that all the blood that has circulated in the head and upper extremities, must descend the aorta before it can return to those parts ; whereas that which has just come from the body and the lower extremities and the placenta, escapes from the left ventricle in a direction which favours its ascent to the carotids and subclavians. Hence it is, perhaps, that the head and superior members are more rapidly evolved than the other parts of the child, being in this way supplied with the greatest abundance of revived or oxygenated blood. It is not to be supposed that every drop of blood coming from below is in this way carried to the head and arms, or that all which has been above must descend to the lower parts and to the placenta ; there must be, to a considerable extent, a commixtion of the two kinds : all that is contended for is, that the major part of the fluid moves as above indicated.

From the foregoing it will be seen that the peculiarity of the fœtal circulation consists in its possessing, first, a ductus venosus in the liver, by means whereof a part of the blood of the placenta proceeds directly onwards to the heart, and another part goes by the circuitous route of the hepatic portal vessels, the hepatic veins and the cava ; and second, a foramen ovale, admitting of the immediate transit of the blood of the right auricle into the cavity of the left auricle ; and third, a ductus arteriosus, by which the blood of the right ventricle is thrown

into the aorta, below its three first great trunks; and fourth, a set of umbilical vessels, through which the whole sanguine fluid of the child may be, by successive portions, brought into close contact with the vital surfaces of its mother. The fœtus, in this sense, might almost be said to touch its mother only by its blood.

The child, in the uterus, grows very rapidly in the last three months of its gestation, and is supposed to be not perfectly developed until the completion of the ninth month; yet many cases are met with in which the child is born several weeks before its time, and thrives as well as others that remain in utero to the full period. Many persons are brought to bed of the first child rather sooner than the regular computation would lead them to expect that event, and not a few are to be observed who invariably fall into labour at the end of the eighth month, giving birth to very healthy offspring.

The common duration of pregnancy is two hundred and eighty days, or forty weeks, but there is a great latitude in the duration of the process, both in women and the inferior animals.

Dr Merriman, of London, has published, in vol. xiii. part ii. of the London Medico-Chirurgical Transactions, a paper on the Period of Parturition, which contains an interesting table of the births of one hundred and fourteen mature children, calculated from, but not including the day on which the catamenia were last distinguishable.

By this table it appears that three were born in the thirty-seventh week, thirteen in the thirty-eighth week, fourteen in the thirty-ninth week, thirty-three in the fortieth week, twenty-two in the forty-first week, fifteen in the forty-second week, ten in the forty-third week, and four in the forty-fourth week, of which latter, one was born at three hundred and three days, one at three hundred and five days, and two at three hundred and six days.

Dr Merriman states that he has calculated a great many more cases in the same manner, but has restricted his table to the above one hundred and fourteen cases because he was able completely to verify them; the

others gave results so nearly similar, that he has no doubt of the general correctness of the principle he desired to enforce, which was, that conception takes place, in general, soon after the cessation of the catamenial flow, and not just antecedently to its expected return. The table is highly interesting, in the relations for which I would use it, showing, as it does fully, that there is a considerable latitude in the duration of gestation.

M. Tessier, in France, caused a set of observations to be made on the duration of pregnancy, in one hundred and sixty cows, which commonly go nine months with young. Three of these cows brought forth on the two hundred and seventieth day; fifty of them from the two hundred and seventieth to the two hundred and eightieth day; sixty-eight from the two hundred and eightieth to the two hundred and ninetieth; twenty went to the three hundredth; and five did not calve until the three hundred and eighth day, which is thirty-eight days beyond term—whereas fourteen of them calved from the two hundred and forty-first to the two hundred and sixty-sixth; which is a latitude in the cow of sixty-seven days. The mare goes eleven months with young. Of one hundred and two mares, three foaled on the three hundred and eleventh day; five from the three hundred and tenth to the three hundred and thirtieth; forty-seven from the three hundred and fortieth to the three hundred and fiftieth; twenty-five from the three hundred and fiftieth to the three hundred and sixtieth; twenty-one from the three hundred and sixtieth to the three hundred and seventieth; and one on the three hundred and ninety-fourth day: a latitude of eighty-three days. For the above account I am indebted to Velpeau, vol. ix. p. 246. The child quickens about the twentieth week, or a little earlier or a little later; so that if a female compute forty weeks from the last menstruation, or twenty weeks from the first feeling of the motions of the child, she may make a tolerably sure calculation of the time of her labour: nevertheless, they make very great mistakes; either because there is a great latitude of the duration; or because the pregnancy may take place just before the catamenia, instead of just after it, which will give a dif-

ference of from twenty to twenty-five days ; or lastly, because some women quicken much earlier than others.

The child may live if born at seven months complete, or even at six months complete ; but in the latter case it is considered as *non viable*, however strongly a few striking exceptions might tempt one to admit it as viable.

Previously to the seventh month, the septum auriculorum is still so pervious at the foramen ovale, that as soon as the child attempts to breathe, it becomes livid, in consequence of a major part of its blood passing at once into the left auricle : the pulmonary artery and its branches being not sufficiently developed to receive the whole torrent ; and the foramen ovale not being yet sufficiently contracted to keep the current from traversing the septum. As the child approaches the term, the foramen ovale becomes more and more constricted ; and of course, the pulmonary arterial branches more and more developed ; and the child, of course, more and more fitted for respiratory life. After birth, and the establishment of regular respiration, the foramen ovale gradually closes ; the ductus arteriosus ceases, by degrees, to conduct off the blood of the pulmonary artery ; and as the umbilical vein is no longer employed, its tissue becomes a mere ligament, while the umbilical branches of the hypogastrics also disappear ; and the last vestiges of the fœtal peculiarities are at an end.

The signs by which a woman knows herself to be pregnant are, the cessation of her regular menses, and the subsequent enlargement of the abdomen and the movements of the fœtus.

A married woman, who has been well regulated, suspects that she has conceived, if she fails to menstruate at the proper term ; but this cannot be ever considered as conclusive evidence of conception, since so many and such various causes are found to obstruct and avert the regular course of the menstrual function. A second failure, especially if it be not accompanied with any signs of depraved health, renders the suspicion still more

valid ; while after a third and a fourth omission, the change of form, and at last the perceptible motion of the embryo put all doubt to flight. I may say, however, with great confidence, that the audible or visible movements of the fœtus afford the only true and infallible signs of its existence.

There are many accidental or correlative signs which enforce the probability of the existence of pregnancy : among which I may mention, nausea and vomiting ; a gradual increase or development of the mamma ; a change of the areola of the breast, which acquires a dark brown hue, and is much relied upon, especially in first pregnancies. The nausea is mostly found to occur in the morning, and is attended in some individuals with a distressing heartburn, and a salivation, or spitting of saliva. Some people are affected with gravel, or dysury, from the extension of irritation to the neck of the bladder, or the pressure of the enlarging womb upon the posterior surface of that organ. An irritable state of the temper indicates it in some women, which is attributable to the general malaise that must attend the gastric embarrassments which the early stages of pregnancy are so commonly found to produce. Tooth ache, ear ache, sties on the eyelids, morpè on the skin, a dark circle around the eyes, and strange unaccountable longings or appetites, are also signs of pregnancy, rather to be noted after pregnancy is fully ascertained, than to be depended upon as sure evidences of its existence.

By means of the Touch, pregnancy may be pretty surely ascertained, before quickening has taken place. I might here say, that, by the touch we can readily learn that the womb is enlarged, altered in form, and contains something ; but I do not see how any physician can absolutely aver what that something is, unless he can perceive a spontaneous motion in it ; so that even the *ballottement*, or tilting the embryo upon the point of the finger, does not furnish, to my mind, any sure evidence that the tilted body is an embryo. I adhere, therefore, to the opinion I have already expressed, that we have no certain signs except those derived from the visible or audible motions of the child.

Auscultation, either by means of the stethoscope or by the direct application of the ear to the abdomen of the woman, enables us to perceive two very distinct sounds, one of which is the beating of the heart, and the other is that which has been called the *placental souffle*, or bellows-like sound; the latter being occasionally attended with a sound like the cooing of a dove. Whenever we can distinctly hear the beating of the foetal heart, so as even to count the number of its pulsations, all doubt must be at an end. The placental sound, or the souffle, is a very distinct sound, and indicates not only the presence of a foetus, but it also shows that it continues to live, the rushing or blowing sound always ceasing as soon as the foetus expires: it is, in some way, not yet sufficiently understood, connected with the movement of the blood in the placenta, and ceases, of course, with the cessation of that movement, which is itself dependent on the systole of the foetal heart.

It is of less consequence to be able to ascertain the existence of pregnancy in the married than in the unmarried woman. By the lapse of twenty weeks it becomes surely known; and the married woman, who has no motive to keep it as a profound and important secret, readily imparts a knowledge of her situation, or her suspicions relative thereto, to the physician, or her friends. Not so with the unmarried female, whose reputation is set at stake upon the concealment of her misfortune, or her crime *contra bonos mores*. I have been frequently very sorely embarrassed by uncertainty as to the condition of a patient whose ruddy cheeks and *embonpoint*, seemed quite incompatible with a suppression of the catamenia, and whose complaints of aches and pains might possibly be only assumed as a means of deceiving the medical adviser. Physicians are frequently applied to by the unfortunate or guilty for relief from "*obstructions*," when the applicant knows full well her design is merely to purchase some powerful deobstruent or emmenagogue, which may serve to procure an abortion, that she knows no honest or respectable medical practitioner could be induced to procure, for any pecuniary reward whatever. I hold it to be a duty, in all cases,

or ranks, to compare the complaints of amenorrhœa with the appearance of the patient, and if some evident malady does not accompany the supposed suppression, to withhold all medical aid, until time or necessity disclose the indications that are to be fulfilled. It is too much to expect that a female, who has it at heart to conceal her pregnancy, will confess it to a medical man. I was requested some time since by a lady to visit a favourite servant, whose situation excited her apprehension, as she had failed to menstruate for the antecedent seven months, and was already considerably swollen with something like dropsy. Being directed to the young person's apartment, I found her in bed, covered up to the throat with bed clothes, but the face that peeped out from above them actually shone with ruddy health, or agitation, or both. The pulse was natural, the tongue clean, the respiration natural, and the entire physiognomical expression as healthful as possible. She informed me that she had had a stoppage of the courses for the last seven months, and felt very bad, and was now alarmed at a swelling of the stomach, which had increased greatly of late. Suspecting that she had an important secret, I asked some questions about pains in the stomach, and upon permission obtained, placed my hand on the abdomen, being almost certain that I should feel the motions of a fœtus; but, however long I held my hand on the abdomen, no movement of a child could be felt; so that, although I was certain that she was pregnant, I was as yet unprepared to tell her so. I at length got permission to apply the ear against the side of the abdomen, and distinctly heard the placental souffle, and afterwards the stroke of the fœtal heart. Upon this assurance I told her she was pregnant. "If I am," she replied, "I wish God may strike me dead," and continued, with much temper and even passion, to declare that I maligned her and slandered her. I was obliged to leave her without the least assent, on her part, to my diagnosis, although she knew perfectly well that I spoke only a truth with which she had been long acquainted. She went out of town, and was confined in the country with a fine boy. Many exam-

ples of similar perverseness, in denying pregnancy, the signs of which were perfectly plain to me, and ought to have been obvious to the most careless observer, have fallen under my notice ; so that I deem it a solemn duty, previously to the exhibition of emmenagogue medicines, to ascertain that some signs of disordered health are present, in order that I may not commit the unpardonable fault of promoting an abortion, instead of removing a morbid obstruction of the catamenia.

There are many persons so ignorant of their own moral duties, or so uninstructed as to the character and duties of medical men, as to come to them with a bold-faced proposition to procure an abortion, in order to conceal a crime or an error. The best answer to all such requests is—that, by the common law such an act is felony, and by the law of God murder ; and that it is as lawful to assassinate for them, any other enemy, as the innocent object of their cruel designs. I think that the persons so situated, and so addressed, will, in general, cease to entertain such unlawful intentions, and no occasion ought to be missed to urge them not to add a new crime to what was probably a misfortune, or a grievous error.

The ovum, however well protected by its situation against the operation of any extrinsic causes of destruction, is, nevertheless, obnoxious to several that may cause its miscarriage. There are also many intrinsic causes that tend to effect its death ; for, since the fœtus is composed of a structure, and has functions that are vastly complicated and mutually dependent, it must be liable to disorders that may interrupt its growth, or health, and at last cause it to be thrown off as an abortion.

The union of the placenta to the surface of the womb is so very slight, that it is easily peeled off ; a blow upon the region of the womb may destroy its connection, and blood be at once effused betwixt the placenta and the womb : if a great quantity be effused, the whole

surface of the placenta may be speedily detached, or loosened, and of course, the ovum, now deprived of the sources of growth, must perish. A sudden and very violent excitement of the blood-vessels, as by surprise, anger, &c. may cause the effusion of blood from the placental superficies of the womb; a contraction of the womb may break the connection; a violent concussion of the body, as by falls, jumping, a rude motion in carriages or on horseback, may cause a detachment to take place; the membranes of the ovum may be so weak and delicate, as to burst upon very slight compression of the womb, as in coughing, straining at stool—upon any sudden and powerful exertion, falls, blows, &c. Thus it appears that the abortion may be caused by the death of the embryo; by disease of the secundines; by sudden violent movements of the blood, causing the effusion of that fluid behind the placenta; by direct violence, or by the discharge of the water of the amnion.

If the ovum be ruptured, there is an escape of water from the vagina, the quantity of which will depend upon the age of the embryo. This is sooner or later followed by pain, and a discharge of blood. The pains, which are uterine contractions, become more and more frequent and considerable, until the remains of the ovum are expelled, when the bleeding begins to diminish, and for the most part, the pain returns no more. If any cause should have been applied that could detach a portion of the placenta without rupturing the ovum, many hours, or even several days might elapse, before the blood that follows the detachment would appear at the orifice of the vagina: the blood must force its way betwixt the chorion, or decidua, and the surface of the womb; but as soon as it reaches the orifice, it falls into the vagina, and then there is what is called a *show*. If the fœtus perishes by an internal disease, or in consequence of some disorder that happens to seize upon any part of the ovum, the further development of the ovum, or of the embryo ceases; it is cast out by the contractions of the womb, that sooner or later must supervene.

In some individuals there seems to be so great an irritability of the muscular fibres of the womb, that the

presence of the conception never fails to bring on their contractions before the completion of the term of pregnancy; and I apprehend that this excessive irritability is among the most common of the causes that produce abortions. This view seems to be maintained by a reference to what happens in those who have already miscarried, since such females are found to be greatly disposed to miscarry again, at about the same period as that at which they had sustained the first misfortune; which appears to me to indicate, that the repeated accidents of this kind are attributable, rather to an excessive or abnormal irritability of the womb, than to any of the other circumstances that are enumerated as causative of abortions; for it is far more reasonable, to suppose that the *same* uterus is endowed with too great a degree of muscular irritability, than to suppose that several successive germs should be so constituted as to perish always at about the *same* period.

Whenever the contents of the gravid womb come to be expelled from its cavity, that expulsion is effected by a real labour, often very severely painful, and requiring for its completion many hours of greater or less suffering. I have had the medical charge of the same women in regular labour and in abortion; and they have informed me that, for acuteness and severity of pain, the abortion has far exceeded the labour at term. The reason why women suffer so acutely in miscarriages is, that the canal of the cervix uteri requires for its dilatation, in the early months, a great deal of power to be employed in forcing down the embryo, which at that time is contained in the cavity of the body and fundus; and the distress produced by this dilatation of a long and firm canal is very great, and might, a priori, be supposed as great as that occasioned by the dilatation of the os uteri, which at the last days of pregnancy has become thin and yielding, whereas, in the early months, the whole cervix, as well as the os uteri, are of an almost cartilaginous hardness and rigidity.

The quantity of blood lost in some instances of abortions is enormous, probably on account of the extreme degree of uterine irritation which the act of abortion

developes. The hemorrhage is apt to continue until the contents of the womb are expelled ; and it is, therefore, highly important to expedite that occurrence by all reasonable means. Unfortunately these means are few. Whenever the flow becomes so considerable as to affect the pulse and the complexion of the patient, it is imperatively required that the medical man should ask for an examination per vaginam ; and he will sometimes find that the ovum is sticking in the cervix, and needs only a little aid to escape from it—but, while it remains it cannot but keep up the hemorrhage. The fore finger may, in such instances, be pushed as far as practicable within the canal of the cervix, alongside of the ovum, and then bent so as to resemble a blunt crotchet ; by the aid of the finger, used in this way, and the assistance of powerful bearing down on the part of the woman, the offending cause is without much difficulty removed, and the effect ceases. When the finger cannot be employed, Dr Dewees's placenta-hook answers extremely well in some examples, as I have had occasion to experience.

If, upon making examination, the state of the cervix is found to be unfavourable to the speedy expulsion of the offending cause, and the hemorrhage be not too threatening, recourse may be had to the application of napkins, wrung out of cold vinegar and water, to the hypogastrium and pudendum ; to the administration of dilute aromatic sulphuric acid ; to the acetate of lead, with opium ; or to the preparations of *secale cornutum*—as the powder, in doses of five to ten grains repeated *pro re natâ*, or the vinous tincture, of which a teaspoonful may be given every half hour, or at intervals of one or more hours, accordingly as the events of the case seem to demand. The lancet may be resorted to, to aid, both in diminishing the hemorrhagic *nisus*, and in favouring the dilatation of the cervix, to which nothing contributes more powerfully than venesection.

But above all the means of putting an end to troublesome hemorrhage, I ought to applaud the tampon, or plug. This tampon may be composed of a sponge ; or what is far better, of pieces of cotton or linen cloth, torn into squares of from two to three inches, which

may be pressed into the vagina, one at a time, until that entire canal is filled and distended with them. They should be kept there by a napkin, worn as for the menstruæ, or by pressure with the hand of a nurse, a napkin being interposed, until the flow is effectually checked, at least. The tampon may be allowed to remain in situ from six to twelve, or even fifteen hours, and when removed, is generally followed by the ovum, or its remains, which are frequently found attached by coagula to the upper part of the tampon. Should any dysury be caused by its presence, the bladder may be readily relieved by the catheter, while the woman preserves a horizontal posture, which should never give place to a vertical one, until all probability of a return of the hemorrhage has disappeared.

I do not understand how a woman can be permitted to die with hemorrhage, in an abortion, while materials for a tampon are at hand, since the discharge may always be effectually controlled by it. The remedy gives no pain, if properly used, and, so far as my experience of its employment bears me out, it never causes any considerable inconvenience ; while, I may add, it always succeeds.

A good many cases of abortion, in the early stage, as from the sixth week to the tenth week, have fallen under my notice, in which the uterus was unable to expel the remains of the ovum, and in which I could not extract it. The female, in such instances, has always recovered without the ovum having been visibly discharged ; but there always was an excretion, continued for many days, of offensive dark coloured grumes and sanies, which I accounted for by supposing that the substances in the uterus had macerated and come off in a state of semi-solution. I think that there is no danger in leaving such occurrences in the hands of nature ; and that it is better to do so than to reiterate attempts, to extract by force, that have perhaps already proved quite vain ; especially, considering that there is as great danger of exciting inflammation by those attempts, as could be anticipated from the gradual maceration of the ovum. I am not disposed to deny that the presence of a putre-

fying substance, even of a small size, in the womb, is capable of developing violent inflammation and fever ; but it has not happened so with me, and I have given the same opinion to some medical friends, by whom I have been consulted, without the least cause to regret having given such advice. Let me be clearly understood, however, to recommend that the last remainders of the ovum should be brought off, where it is practicable by means of any reasonable efforts.

I shall not omit the present opportunity for saying, with regard to the tampon, that it is not a remedy for those cases in which any hope is yet entertained of saving the pregnancy. Let us suppose an instance in which the placental attachment has taken place at the fundus uteri ; that a partial detachment of the placenta has happened ; and that the blood, having forced its way in a narrow stream, or rivulet, betwixt the womb and the outer surface of the ovum, has at length made its appearance at the pudendum. Nothing is more common than to see such cases of *show* suppressed by venesection, recumbency, an opiate, some elixir of vitriol, or cold lemonade. Should any practitioner, anxious to promote the formation of a coagulum, and thereby stop the effusion of blood and save the pregnancy, have instant recourse to the tampon, what would be the consequence ? The blood, instead of escaping externally, would be forced back on the ovum, while the newly effused portions of it, instead of flowing by the route already formed, would contrive to dissect off or separate the ovum more and more, until the whole of it should be detached, and at last come off, enveloped in the centre of a compressed clot. To use the tampon, therefore, is to insure the abortion ; hence it is only a remedy for the hemorrhage of abortion, and not a remedy for miscarriage, which it not only cannot prevent, but actually insures, or renders certain. The blood which continues to flow into the womb, after the vagina has been closed by the tampon, may be compared to a river dammed across its channel, and whose waters, in consequence, overflow their banks, drowning the adjacent country.

With regard to the tampon, I have further to add, that

its employment in advanced stages of pregnancy, although allowable in certain instances, demands very great discrimination, inasmuch as it is capable of converting an open into a concealed hemorrhage, as we shall have occasion more fully to remark when we come to the consideration of uterine hemorrhage, in labour. It may with safety be employed up to the close of the fifth month of gestation, as the womb, until that period, is incapable of admitting a sufficient quantity of blood to give any well grounded fears of a fatal concealed hemorrhage; but at a later stage, the capacity of the uterus is so much increased that the tampon, if employed at all, ought only to be used while the practitioner himself carefully observes its effects, resolving to remove it in case the uterine cavity should become distended, and filled with either fluid or coagulated blood in a threatening amount. I was told, not long since, of an instance in which a gentleman, treating a case of hemorrhage after delivery, was pressingly called for to visit another woman in labour, and as he felt compelled to go, he tamponed the vagina with his handkerchief, by which means he effectually suppressed the apparent hemorrhage, but, upon returning shortly afterwards, found the patient dead; the womb having filled with blood, instead of that fluid having escaped at the vulva—just such a conclusion to the affair as ought to have been expected from the use of the tampon under such circumstances.

It is commonly thought that women who suffer under repeated abortions, are quite as much as, if not fully more subject to a consequent prolapsus uteri, than those who are confined at full term. The natural tendency of labour is to produce a prolapsion of the womb, and that tendency must be much greater where the vagina has been so much distended and pressed out of its ordinary form, than where the vagina has not been so affected. But those women who miscarry, are, for the most part, not sick any longer than during the actual miscarriage. They generally get up, most imprudently, the next day, or in some instances even on the same day. The solid and weighty substance of the uterus now bears down the vagina, to whose upper extremity the womb is at-

tached; and the vagina, weakened and relaxed by the discharges of the miscarriage, makes less resistance than is common, so that the womb takes permanently a much lower level in the pelvis than it ought to have. All the difficulties and embarrassments likely to accrue from this vicious situation of the womb, might be obviated by a modicum of patience and prudence in the beginning. The woman should be told, in plain, but urgent language, that too early a getting up exposes her to the great risk of having a falling or bearing down of the womb: but she feels so well after the abortion, as to be quite unwilling to maintain a recumbent posture more than a day.

It is very difficult, at least for me, to account in a satisfactory manner for some of the symptoms by which prolapsions of the womb are accompanied. These symptoms are, pain in the loins and region of the sacrum, accompanied with a sense of dragging weight, whenever the female continues long upon her feet, either in standing or walking. There is also, very generally, a pain extending from the region of the spleen, or that of the liver, down towards the groin—pain, that is very frequently maltreated as hepatic or splenic, and sometimes as nephritic; particularly where it is accompanied with some derangement of the chylopoietic viscera, or with dysuria or strangury.

There is also very frequently to be observed a great complaint of tenesmus, and such a sense of pressure upon the floor of the pelvis, as makes the patient think that every thing is coming away from her. The belly too is often flatulent and painful, and there is aching of the thighs and even of the legs. I repeat that I find a difficulty in discovering a rationale for all these symptoms. The facts are as follows. The womb is attached to the upper end of the vagina, which is a membranous tube or canal, serving as its ductus efferens: the vagina itself has no power whatever to sustain the womb at its proper level in the pelvis; the weight even of the unimpregnated uterus would crush the vagina down,

were it not that the vagina is held in its proper place by the vesico-vaginal and the recto-vaginal septa; for it is not to be conceived that the ligamenta lata have any other effect than to stay or steady it, and obviate its disposition to fall over on its side, to the right or to the left. Suppose the vagina and uterus to descend; then either the bladder and rectum must also descend along with it, or else the cellular tissue, which composes the bond of union or septum, must be put on the stretch, and even considerably elongated. The neck of the bladder must, by such a teasing influence as this, become, in time, considerably irritated, and in that way cause a dysury or strangury, which can be removed only by replacing the uterus in its proper position, and keeping it there by a long recumbency, or else by first pushing up the womb, and afterwards keeping it up by means of a pessary.

Considering that a very slight degree of prolapsus uteri is capable of bringing on and maintaining the pains in the back, one can hardly be induced to suppose that the dragging of its vessels and nerves could occasion all the disorder; nevertheless, such disorder disappears immediately after the uterus is replaced, and if sustained in its proper position by a pessary, or by a suitable attitude of the patient, does not return.

I have been accustomed to regard much of the distress experienced by females with prolapsus, as belonging to the class of neuralgic disorders, and my opinion on this point has been, for many years, confirmed by the occurrence of singular cases, to which I had not seen any allusion in books, until I met with an account of similar cases in the recently published work of M. Maunsell, of Dublin, a work which although small in size, is replete with sound doctrine, and rich in numerous and important practical details. These cases I have been, for several years past, in the habit of relating in my lectures, as will be easily recollected by any of my pupils who may peruse this page. I have also spoken upon this subject before a numerous assemblage at the Philadelphia Medical Society, in the winter of 1833 and 1834. The cases to which I allude may be exemplified by the ensuing statement.

On the fifth day of July 1828, I was called to see ———, a mulatto woman, in Water street, aged about thirty years. She was lying upon her back; the knees were drawn up; and she was supporting the bedclothes with her hands, lest they should press upon the abdomen, which was so exquisitely tender and sore, that she could by no means endure their weight or pressure. She had been suffering this pain for many hours, and had a short quick respiration, on account of the pain which any extensive motion of her diaphragm communicated to the abdomen, and which made it necessary for her to restrain the respiratory movements as much as possible. Upon hearing her account of the symptoms, witnessing her distress, and observing her decubitus, I was at first convinced that she was labouring under intense inflammation of the peritoneal coat of the intestine. The slightest pressure of my hand on the abdomen was resisted with exclamations; for the part was, to the greatest degree, quick and sensitive.

Upon examining the state of the pulse, which I expected to find tense and corded, I was much surprised to discover that it was nearly natural, as respected its frequency, volume and hardness. The incongruity of the signs derived from the examination of the abdomen and of the pulse, led me to make further inquiries. She had borne several children, of which the youngest was now about a year old. I became convinced that her pains were those of prolapsus—a neuralgic state of the abdomen, produced and maintained by a misplaced womb. In brief, I obtained permission to make an examination per vaginam; and upon pushing up the womb, which I found very low down, near the vulva, the abdominal pain suddenly ceased, and in a few minutes afterwards she could bear, and did bear, without shrinking, the rudest pressure of the hand on the abdomen. This was the second instance of this sort of disorder I had met with; the first one having occurred in a young unmarried woman, about two years before. Since that period I have seen not less than six similar cases, all of which bore, with the exception of the state of the pulse, the most striking resemblance to acute peritonitis.

I feel well assured that instances of disorder of the kind just pointed out, can only be properly denominated by the title of neuralgia with prolapsus uteri.

There are many cases of prolapsus uteri that require, for their cure, only a short confinement to the recumbent posture; others are so inveterate that a mechanical remedy is indispensable, because the tissues which sustain the womb at its due elevation in the pelvis, when once very much altered in their density, do not recover until after the lapse of a considerable portion of time.

The mechanical remedy to which I have alluded is called a Pessary. This is an instrument which, being introduced within the vagina, and allowed to remain therein for several weeks or months, supports the womb at its due height in the body, and thus obviates all the inconvenience experienced from its prolapsion. Thus if a female with prolapsus be suffering ever so severe pain, or sense of dragging weight in the pelvic region, and the womb be lifted up on the point of the finger and sustained there for a short time, the pain and dragging sensation cease, and do not return until the uterus again falls down very low, and begins to excite again the neuralgic affections connected with its displacement.

Pessaries are made of various shapes, and of a great variety of materials. Many are made of a piece of cork, cut into a proper form, and repeatedly dipped in melted wax, until covered with a thick coat of that substance. The objection to this kind is, that in the warmth of the organs the wax is so much softened that the rough surface of the cork sometimes becomes uncovered, and then irritates the parts with which it is in contact. Others are made of the same material that is used for the construction of elastic catheters and bougies. Others again are made of glass, blown by the glass-blower into a convenient size and form. Some are used that consist of silver, and others are of silver washed with gold. Of the metallic pessaries now in use in our American practice, two kinds are prepared: one of which is the flat pessary, or rather the disk-like pessary, which is concavo-convex, with very thick periphery, and a small opening in its centre; the other is a globe of silver, washed with

gold, so as to prevent the oxidation of the metal. Both these pessaries are made of plates of metal, so thin that they are sufficiently light; and as the gilded surface admits of a very high polish, they are as little likely to irritate the parts they touch, as any foreign body that could be constructed. I much prefer the metallic to the glass pessary, on account of the greater lightness of the former, and on account of its having quite as good a polish. It appears to me that a globular pessary is capable of fulfilling all the indications that could be possibly collected, for a mechanical remedy, in this affection. I prefer it, therefore, to all other forms of this instrument; and since it cannot become displaced by turning on its axis, a fault frequently found with the flat or disk-like pessary, I am fully confirmed in my opinion of its superior value. I shall take this opportunity to mention that I was, not long since, informed that a female labouring under prolapsion, to a very great degree, made use of the ring of a parasol, which having dipped in melted wax until sufficiently coated with it, she introduced it herself into the vagina, and has worn it for twenty years without her husband having, even until this day, the least knowledge that she uses such a remedy. It seems that she is unable to dispense with the support that the instrument gives her; since, whenever she removes it, the pains, and sense of weight or dragging, return immediately. I may also mention that another lady, of my acquaintance, wore one of the globular form during ten years, without removing it once: it has now been dispensed with for at least ten years, and her health remains excellent.

There are certainly many instances to be met with in which the pessary fails to effect a cure, probably because the relief it yields is so great as to lead the individual to abandon all other precautionary or medical measures, feeling that with this resource, a sufficient degree of comfort may be obtained. Such a course is, to say the least, not just to the patient, nor to the instrument, since it should not be expected that the mere reposition of the parts could cause them to recover their original firmness or density, however it might conduce, with other remedies, to so desirable an end. It is, notwithstanding, to

be said, that if a pessary should, after being properly adjusted, sustain the uterus at its proper level in the excavation, the pressure of the globe upon the tissues which enclose it could not fail to have a great tendency to condense those tissues, and thus obviate that relaxation of them which constitutes the pathological essence of the disorder. I am very certain, from actual observation, that this pressure does exert such an influence as I have mentioned; I have noticed it, particularly in the case of a lady from the country, who sent for me a few months since, and informed me that she was suffering very much from a prolapsus, notwithstanding that she wore a flat pessary, which had not been removed for two years. Upon withdrawing the instrument, I found that the vagina had firmly contracted upon it, and felt rigid, and hard, and shortened, as if moulded upon the pessary. The removal of the instrument was followed by the complete relief of the patient, who has continued since that time to do without one, and not to require one. This hardening, or condensation of the tissues, from the continued contact of a foreign body, is a pathological occurrence commonly to be met with, as, for example, in the case of a bullet lodged in the tissues, which is soon surrounded by a special sac; and also in the case of a calculus in the bladder, which not unfrequently is enclosed more or less completely in a sac, which is formed around it in consequence of irritation and pressure.

In order to concur with the restorative action of the pessary, the patient ought to avoid the causes that favour the production of prolapsus. In an especial manner ought she to avoid the injurious influence of constipated or overloaded bowels, which, not only by their weight, but by inducing a sort of tenesmus, greatly promote a descent of the womb. The bowels should, therefore, be kept in a soluble condition by small doses of neutral salts, magnesia, lenitive electuary, milk of sulphur, or even with rhubarb, taken in the smallest quantities that may suffice to produce an aperient effect. She should avoid all sorts of exercise or occupations that might keep her long on her feet; all violent straining efforts at lifting: and she should wear no tight dresses,

especially corsets, which, by narrowing the waist, always have the effect of depressing some of the contents of the abdomen, that are thus thrust by them down into the excavation of the pelvis.

For the adjustment of the pessary several preliminary steps are required, of which I shall now proceed to speak. Whenever it is, in any case, probable that the complaints of the patient depend upon prolapsion, an examination per vaginam ought to be made, in order to determine, first, the existence and degree of the disease; and second, the necessity for, and the size of the instrument to be employed. Or, if the examination be determined upon, it is well for the physician to provide himself with at least two pessaries, one of two inches, and one of two inches and a quarter in diameter, so that, if necessary, a choice of them may be made and the whole operation concluded on one occasion, whereby the female is spared the disagreeable necessity of a second or third exposure to the operation.

It is, in general, much to be desired that the bowels should be opened previously to the introduction of the globe, and this object can be attained by an enema, or a dose of castor oil properly timed. Attention to this point is the more emphatically indicated by the probability that the mere presence of that globe in the vagina might excite the expulsive action of the rectum, which, if possible, ought to be prevented, until a whole day, or a day and a half shall have passed: when the expulsive action of the bowels takes place too soon after the introduction of the instrument, it is almost always forced out of the vagina, and then requires be replaced.

In order to introduce the pessary, let the patient be placed on her left side, with the knees drawn up, near the edge or foot of the bed. She ought, of course, to be entirely covered with the bedclothes. If the parts be found very much constricted, no attempt ought to be made to introduce the instrument, until after they shall have been somewhat dilated by the insertion of two or more fingers of the right hand into the vagina, which may be used, at the same time, to draw the perineum and end of the vulva downwards and backwards. A gentle

and patient operation of this sort very soon prepares the organs for the final steps of the process, namely the introduction of the instrument.

The pessary should be dipped in a cup of olive oil, or it should be smeared with fresh lard, and then pressed against the top of the arch of the pubis, and steadily carried beneath that arch, and then behind and above it, until the whole ball has passed above the confines of the constrictor vaginae muscle, which is known by all resistance ceasing. The introduction ought not to take place too easily; for, if only a slight force is required to insert, an equally slight force might suffice to expel it—a vexatious case that always follows an injudicious selection of the instrument.

It is but rarely that I have found it important to push up the prolapsed organs, previously to the adjustment. The replacing them is as easily effected by the ascent of the ball, as by the ends of two fingers, and with less pain or discomfort.

After the operation is concluded, the patient may rise and walk a few turns about the room, in order to learn whether any change, as to the symptoms, can be observed, and whether the instrument gives any pain or uneasiness; and if all proves to be right, she ought to return to the bed, or lie down upon a couch, for at least a day, in order that the parts, by contracting sufficiently, may not admit of a procidentia of the pessary itself, or in order that the sustaining or supporting office of the globe may not be in the least degree counteracted.

An injection may be daily used for the vagina, to be composed of a decoction of red bark and nut-galls, half an ounce of each, in powder, to a pint and a half of water, to be boiled down to a pint. This injection should be thrown in from a common female syringe, and should, if possible, be detained at least half a minute in contact with the surfaces.

The instrument ought to be worn for at least three months, not requiring to be removed either on account of the flow of the catamenia, or on account of cleanliness, which is sufficiently provided for by the daily use of the

injection, and employment of the sponge and a basin of cold water.

After the lapse of three months, the pessary can be safely removed, for at least a fortnight, during which time the patient ought scrupulously to avoid all the causes that tend to produce a bearing down of the womb; such for instance as costiveness, violent exertions, long walks, long continuance in a standing position, &c. &c. The fortnight having passed, the pessary should be again adjusted and worn at least one month, during which time the injection ought to be repeated once a day; after this the pessary may be again removed for a short time, and its application repeated according to the necessity of the case.

In those instances where pregnancy ensues, the symptoms disappear about the period of quickening, and are not likely to return until the patient begins to take exercise after the accouchement. Hence, great care is necessary to restrain her from rising too soon from her bed; and, if all such precautions should seem to fail, the pessary may safely be applied for a month or six weeks; beginning from thirty to forty days after the birth of the child.

In proportion as pregnancy advances, the womb increases in longitudinal diameter; so that if it should from any cause happen to be turned over backwards, the top of the fundus uteri would lodge in the hollow of the sacrum, while the os tincæ would be pressed upon the symphysis of the pubis, or above it. The fact of such a displacement being occasionally met with cannot be doubted, and the inconveniences and dangers arising from it are too numerous to admit of my passing over it here without a few remarks.

Considering that the antero-posterior diameter of the pelvic excavation is equal to four and a half inches, it is reasonable to suppose that the unimpregnated womb cannot readily be caught under the projection of the sacrum, even if it be liable to be thrown backwards

under that promontory. Yet the unimpregnated uterus is liable to be turned over, or retroverted, and retained, until the reposition of it be effected by a skilful hand. There is no reason to doubt that the uterus is frequently turned over backwards, but not retained; for the urinary bladder, when very full of water, extends backwards and downwards, pushing the top of the womb along with it. If this happen to a woman about two and a half or three months gone with child, she will scarcely fail to have a *retroversio uteri*.

Suppose the fundus to be caught and detained under the promontory, as just above mentioned, and that the child still proceeds in its growth, carrying with it the womb in which it is enclosed; the consequences are a complete impaction of the womb into the excavation—a total prevention of the flow of urine, by pressure on the urethra—a stoppage of the canal of the rectum—severe pressure upon the internal sacral foramina, with their nerves; and unless by timely measures obviated, the certain and miserable death of the patient. In the case examined by Dr Hunter, so completely impacted, or jammed, was the womb into the cavity of the pelvis, that after the death of the patient it was found impracticable to get the womb up out of the excavation, until the pubis was cut through with a saw, in order to admit of the enlargement of the brim of the pelvis. It is difficult to conceive of a situation more frightful than that of a patient under such circumstances.

Most of the instances of retroversion are attributable to a distended bladder. The modest delicacy of women often compels them to resist the most urgent desire to pass off the urine. A female riding in a carriage, or placed in such a situation that she cannot withdraw from the company without being suspected of a desire to urinate, will allow the bladder to fill almost to bursting; and if she be pregnant about three months, she will scarcely fail to have retroversion of the womb. When at last she obtains an opportunity to evacuate the bladder, she finds she has a partial or total suppression of urine. The usual recourse is had to spirits of nitre, to water-melon seed or parsley root tea, and perhaps a dose of

castor oil may be resorted to; but as relief can only come by some mechanical remedy, the medical man is at length, and reluctantly, sent for.

To see a healthy looking woman seized with complete suppression of urine, without having been before the subject of any urinary ailment, is warrant enough for us to suspect a retroversion of the womb, especially if the patient be at the time pregnant, and not advanced beyond the fourth month. The symptoms of which such patients complain are either total suppression, a stillicidium, or great dysury; with pains about the region of the pubis and sacrum, with great tenesmus, or bearing down, and a sense of obstruction or stoppage in the rectum.

No case like this ought to be suffered to pass without making an examination per vaginam. For this purpose let the patient lie on her back, near the right side of the bed; the feet drawn up near to the breech; the head and shoulders raised with pillows. The physician should stand by the bed side, and with his left hand placed upon the hypogastrium, ascertain if the bladder be much distended: it will sometimes be felt almost as high up as the umbilicus. The forefinger of the right hand may next be carried into the vagina, in order to seek for the *os tincae*, which is to be found behind the symphysis pubis, or even thrust over and above it: the vagina seems to be obstructed by a hard body, which is the bas-fond of the womb, whose fundus is turned down into the hollow of the sacrum, and jammed into the cul de sac, composed of the reflection of the peritoneum, which lines the upper half of the vagina and the front of the rectum.

Having thus verified the existence of a retroversion, the next steps required to be taken are those that are demanded for the repositing the womb. Among the most pressing indications of cure, is the relief of the suppression of urine, which in general is easily fulfilled by the introduction of the catheter, which should be a male catheter, composed of the French elastic material. A long one is the best, because the womb, in changing its own position, carries up the neck of the bladder, and thus elongates the urethra so very considerably, that it will

be found convenient to use a long instrument for the evacuation of the water.

Inasmuch as the most ordinary cause of retroversions is a distended bladder, it has been thought that the removal of this distension is the best remedy, it being supposed that the uterus would recover its attitude as soon as the pressure which overset it should be taken off. Indeed there are cases in which the restoration takes place soon after the bladder becomes emptied. It has also been contended that a sound discretion indicates the propriety of leaving the case in nature's care, after this preliminary measure has been accomplished, lest by any rude or too persevering attempts to replace the womb, the ovum might suffer so much injury as to bring on an abortion. I admit that I am not prepared to decide as to the necessity for such great prudence, since I have only on one occasion put it to the test: and on that occasion I drew off the urine two successive days, the accumulation being very great; and then finding that the malposition was not rectified, I was compelled to replace the womb with my hand: no inconvenience whatever followed the operation, although the patient was near four months complete, gone with child. In a subsequent pregnancy, the same person suffered a retroversion of the womb, nearly at the same period; and when I was called to see her, I immediately proceeded to restore it to the proper attitude. In this case also the pregnancy was not in the least interrupted.

Having succeeded in drawing off the water, the patient, if necessary, should have a copious enema, in order to unload the rectum, which, if replete with fœcal matters, might offer considerable obstacles to the success of our attempt. In the next place we ought to endeavour to raise the fundus, by pressing the bas-fond of the womb, which can be felt through the under surface of the vagina, upwards, so as to lift the whole mass in a direction parallel with the axis of the brim. The cervix uteri is tied to the more anterior parts of the pelvis by the vagina and the vesico-vaginal septum, so that if we carry the mass considerably upwards, it must be by tilting the fundus in that direction. Attempts of this

kind will not always suffice. Where they fail, a finger may be passed into the rectum, the forefinger of the left hand, if the woman is on her left side, and of the right hand if she be upon her back. Before the finger has passed very far, it meets with the fundus uteri, which presses upon the canal of the intestine ; in this situation we have far more power to move the womb than when the effort is made only from the vagina. Pushing gently and steadily upwards, we find the mass gradually to recede, and at length the fundus, liberated from its restraint, suddenly emerges, with a sort of jerk, from under the promontory, from which instant the woman is cured.

I have sometimes failed of success, until I placed the patient in a more favourable attitude ; one in which she could not bear down, and thus oppose the success of my measures. I have directed that she should turn on her face ; then draw her knees up under her until the thighs were in a vertical position, giving to the pelvis the highest possible elevation : the face was to be placed on the bed without pillows, and the point of the thorax was also to be touching the bed. Lying in this posture, the effect of mere gravity might suffice, in time, to unhitch the fundus uteri from beneath the promontory ; since all tenesmus and bearing down are arrested. After waiting a short space, until the effects of the position were secured, I have pushed up the fundus very easily, by acting either through the vagina or the rectum.

A woman who has just recovered from a retroversion ought to lie in bed two or three days, and should never be left more than six or eight hours without evacuating the bladder, spontaneously or by the catheter, lest that organ, filling again, should unhappily a second time depress the fundus, and thus cause us to lose all our trouble for want of a moderate precaution.

The gravid womb, doubtless, becomes in four months and a half too large to admit of the occurrence of retroversion : but the accident may occur at any period short of it ; it may take place not only in the non gravid, but in the virgin uterus.

On the 22d of February 1828 I was called to visit

Elizabeth B., aged about twenty years. She has complained for several months past of dragging pain in the left side of the abdomen, with a sense of weight and great uneasiness within the pelvis. Has menstruated regularly. For the last three weeks has been persecuted with constantly repeated and painful desire to go on the stool; with symptoms of strangury, or dysury, amounting often to *stillicidium urinæ*. After a careful inquiry into the history of her case, I informed her of the nature of my diagnosis; and she at length agreed to permit an examination by the touch, as I assured her that I had no means of relief for her, if there were really a retroversion, short of the touch. In this painful necessity she submitted, with a laudable unwillingness, to the operation, and it was with no little difficulty that I at length carried the finger beyond a remarkably strong hymen into the vagina. The os uteri was found near the symphysis of the pubis, and the fundus was discovered overturned into the peritoneal cul de sac. After a long perseverance in endeavouring to raise the fundus, I was compelled to attempt it with the forefinger of the left hand passed into the rectum, by which method I pushed the uterus up; whereupon she immediately declared that she was fully relieved of the sense of weight and pain that had so long been tormenting her. She continued well from that moment. I consider this as a case of considerable interest, inasmuch as it proves the possibility of a long continued retroversion of the womb in the non gravid state of that organ.

The accident of retroversion may be considered serious or dangerous, just in proportion as it occurs at a more advanced period of pregnancy; for according as the pregnancy is of an older date, is the necessity greater for a speedy reposition of the organ. I have, I think, pointed out sufficiently at length, the dangers to be apprehended from a retroversion continued until the whole mass becomes so impacted into the excavation, as to render its extrication, without abortion, impossible. As I have met, as yet, with no example in which it was impossible to replace the organ, I do not feel it incumbent upon me, at this time, to do more than refer to the severer

methods of extricating the woman : which are, first, the artificial rupture of the amniotic sac, which, by allowing the water to escape, reduces the size of the womb so much as to enable the operator to succeed in restoring it to its proper position ; or lastly, the puncture of the womb itself, when it is found impossible to pass a bougie into the os uteri.

I have witnessed several accouchements in females reduced to the last degree of weakness and emaciation by pulmonary consumption. In these cases I have not found that the child partook of the debility and cachexy of the unhappy mother. In one case that fell under my care the patient laboured under laryngeal consumption, and was to the last degree emaciated and feeble, notwithstanding which, her pregnancy held out until the completion of her term, which she survived only four or five days. Her child was excessively fat, weighing above ten pounds ; and has continued to enjoy excellent health up to the present time, when it is between five and six years of age. These instances convince me that no methods that have yet been discovered can serve to prevent the development of the child, and thus cause the woman to suffer less in her accouchement than she would do if her child were to be small.

Notwithstanding that I think no means are within our reach of procuring easy labour by retarding the growth of the child, I am far from abandoning all precautions as regards the mother herself. A woman about to suffer the peril and pangs of childbirth should be prepared for the crisis by a course of dietetic treatment, to commence a few weeks before her term, and by an occasional venesection, and the use of a gentle aperient that may serve to secure the regular evacuation of the bowels. The diet need not be rigorous, but it should exclude, for the last eight or ten days, all meats and butter, and highly seasoned food. The bleedings should be small, and repeated two or three times, from the seventh to the ninth month. A neutral salt, calc. magnesia, or sulphur, are

the best of the aperients for the purpose now under consideration. Gentle exercise, in walking or riding, ought not to be neglected by those who desire to promote the heathful performance of the great vital functions, and to prepare them for the struggles of labour, or for a firm resistance to the shock that the constitution often suffers by delivery. I have met with a good many instances of severe suffering during or after labour, that I supposed justly attributable to the inordinate indulgence of the appetite in the latter weeks of pregnancy.

CHAPTER X.

LABOUR.

IN Midwifery, the term Labour expresses the whole series of phenomena that attend the birth of a child. Labour is the process by which the contents of the gravid womb are expelled; and the word is highly expressive of the violent and painful struggles and efforts, of the woman, to overcome the obstacles to her deliverance from the burthen which she has so long borne. It should commence, as we have already seen, at or about the two hundred and eightieth day from the last appearance of the menses, or the one hundred and fortieth day after quickening; and may, in general, be expected to terminate without any artificial power or assistance, after a few hours of travail—the time being greater or less, according to the amount of the power capable of being employed, or the resistance that is destined to be overcome.

The essential element of labour is the contraction of the muscular fibres of the womb, the end or object of which is the evacuation of the uterine cavity, so that, the whole of its contents being ejected, it may return again to the non gravid state, when it will measure from two and a half to three inches in length, about an inch and a half in width, and half an inch or three quarters of an inch in thickness; the organ being, before the commencement of contraction, about twelve inches long by seven or eight inches in transverse diameter.

As the os uteri is closed during pregnancy, it follows that the expulsion of the contents of the organ cannot take place until the orifice is sufficiently opened to permit the child to pass out ; and that there is also required for the purpose, a sufficient dilatation of the vagina, and of the vulva, in all which parts a greater or lesser degree of resistance or obstacle is found ; which, taken in connexion with the resistance afforded by the bony structures, are generally the causes of a delay of several hours in the birth of the child, even where it presents itself most favourably to the openings through which it is destined to effect its exit.

In a vast majority of cases, the powers of the womb, alone, are insufficient to effect the delivery of the child ; and its birth is aided very considerably by the efforts of the abdominal muscles, and the diaphragm, which are not only capable of making a direct expulsive effort, but also, by presenting a point d'appui for the contracting womb, can enable it more efficiently to exert its own peculiar forces. The abdominal muscles, acting alone, can push the point of the womb down low into the excavation, and hold or fix it there, while the fundus and body of the organ propel the ovum against the obstacles that stand in the way of its escape. Hence, although the essential element of labour consists in the uterine contractions, there are collateral elements of the process that greatly avail in its completion, and that ought always to be well understood, in order that they may be either called into action, or restrained, as the obstetrician may please to direct.

The cause of labour, or I should rather say the cause of the onset of labour, is not well understood ; although it is quite probable that it is to be found only in the inability of the womb, in any given case, to bear further distension. Labour begins from a necessity of the uterine constitution, and not from any ascertained degree of development of the child, which, whether large or small, is most likely to be born two hundred and eighty days

after the last catamenial period of the mother ; but it may not be born until three hundred or even more days have elapsed ; and the size of the child is not found to bear a proportion to the excess of the duration of the pregnancy. It does in fact, frequently occur, that the womb begins its contractile effort long before the expiration of the two hundred and eighty days ; or, on the other hand, fails to commence its contraction for several days after the two hundred and eighty have elapsed ; but, whenever it does begin, it is because it will admit of no further or longer continued distension.

The theory by which Baudelocque endeavours to account for it is, that there is a contest or antagonization betwixt the fibres of the cervix and those of the fundus and body of the womb ; that in the early part of pregnancy, the fibres of the body and fundus yield to, while those of the cervix resist the distending force, until about the seventh month, at which time they also begin to yield, and continue to yield until the end of the ninth month ; these fibres of the cervix may be regarded as the seats of the retentive, while those of the fundus and body are the seats of the expulsive faculty or power ; at the ninth month they are balanced, or antagonize each other exactly. At length, those of the fundus become the more powerful, and the cervix and os uteri are dilated, and finally so completely opened as to allow the ovum to escape. This explanation is, perhaps, as good as any that could be offered ; but, although human sagacity or reason may remain ever incompetent to the task of unfolding the secret operations on which the commencement of labour, or the completion of utero-gestation depends, it is perhaps not unworthy of remark, that, in the development of the gravid uterus and its contents, we behold a wonderful adaptation of parts to the purposes they are destined to fulfil ; since the growth of the child would, if continued, make its delivery impossible, and therefore the Author of nature has, by a simple law, provided against such a fatal contingency ; the womb, by that law, refusing to yield any further than is sufficient to allow the child to acquire a certain degree of magnitude and

vigour, essential for its respiratory life, but not too considerable to prevent its birth from taking place.

The term of utero-gestation and the commencement of labour are also fixed, and rendered necessary by the great distension of the abdominal muscles, and the pressure upon, and displacement of the parts contained within the abdomen. I know not what influence, on the production or excitement of labour, may be exercised by the altered state of the abdominal muscles themselves, but it is perhaps not too much to infer, that, they do at length exert some considerable share of influence, by their constant or tonic contractile operation, in aiding the fundus and body to overcome the retentive effort of the os uteri, any yielding or relaxation of which tends to invite or provoke the contractile effort of the fundus. We see, at least, that, in the last days of pregnancy, the womb settles down with its apex in the excavation, and the woman seems much smaller than she was before this sinking downwards of the uterine globe was perceived : now it may be asked, what can cause this settling or sinking downwards of the womb, if it be not either the action of the abdominal muscles and diaphragm, which have pushed it downwards, or the contraction of the womb itself? It is probable that both of these influences are, sometimes, concerned in the matter ; and at other times only one of them, and either of them ; for it happens that when the womb is much sunken, it in one case feels very hard and firm, as if its fibres were in a state of contraction or condensation, whereas in another case it is soft and flaccid, notwithstanding it may be very much depressed into the excavation ; in either example, no sign of actual labour being present. The sinking downwards of the womb takes place, in some persons, several days before the first pains are felt. In such cases it must generally be regarded as wholly passive in the matter ; it is forced down by the muscles, and not by any intrinsic action, or power of its own.

The contractions of the womb take place at intervals, which are long at the beginning, but grow shorter as the labour advances. They last from fifteen to thirty or forty seconds, and on many occasions, even longer.

The intervals, at first, are from twenty to thirty minutes ; but as the irritation becomes more intense, the pains are repeated every five, three, and two minutes, and even every minute ; increasing in violence and duration until the organ is freed from its load.

The pain felt in labour, is owing to the sensibility of the resisting, and not to that of the expelling organs. Thus the sharp, agonizing, and dispiriting pains of the commencement of the process, which are called grinders, or grinding pains, are surely caused by the stretching of the parts that compose the cervix and os uteri. They are not felt, except rarely, in the fundus and body of the organ ; and nineteen out of twenty women, if asked where the pain is, will reply that it is at the lower part of the abdomen, and in the back ; indicating, with their hands, a situation corresponding to the brim of the pelvis, and not higher than that—a place corresponding to that of the os uteri.

When the pains of dilatation are completed, and the foetal presentation begins to press open the vagina, the pain will, of course, be felt there, and is at length referred to the lower end of the rectum, and the sacral region generally. The last pains, which push out the perineum and put the labia on the stretch, will of course be felt in those parts chiefly. The painful sensation, under these circumstances, is represented as absolutely indescribable, and as comparable to no other pain.

The effect of the pain on the bladder and rectum might easily be foreseen ; and even where it fails to excite the sympathetic action of those parts, the descent of the foetal head, which sometimes fills up the pelvic canal, as a cylinder is filled by its piston, must cause the evacuation of the entire contents of the lower rectum.

The effects produced by the pains and efforts of labour upon the constitution are very striking. The mind, in the beginning, is anxious, irritable, fearful, and full of the most gloomy anticipations ; but as the process goes on, and the expulsive efforts become more and more violent, it acquires courage and firmness and the most dogged resolution. The patient seems like one

who has a task set for her, which she is resolved to execute as rapidly as possible, and she bears the great pains of expulsion far more submissively, or rather courageously, than the small or dilating pains. The actions of the woman indicate pretty clearly, to the practised eye, the state of advancement of the fœtus. Antecedently to its exit from the os uteri, or its deep insertion into that circle, the voluntary efforts of the patient are confined to a violent grasping of things with her hands. She generally seizes the hand of a bystander, and squeezes it very violently, or endeavours to twist or wring it. Such an action always indicates a grinder, or a pain of dilatation, but when an expulsive force takes place she not only grasps with all her force, but she pulls at any thing in her reach ; so that an experienced accoucheur generally can decide, upon entering the chamber, during a pain, that the dilatation is or is not completed, by observing whether the patient merely squeezes or presses the hands of her assistants, or, on the other hand, whether she pulls them with great violence.

In addition to the signs derived from the woman's actions, the practitioner can frequently decide upon the degree of forwardness of the labour, by attending to the nature of his patient's expressions and moans, and her respiration. In the dilating pains she either gives out her breath freely, or merely holds it, making use of no straining or bearing-down effort, and even if she be requested to strain or bear down, as if at stool, she will resist, or cannot obey the injunction. On the other hand, when the os uteri is nearly or quite opened, and the expulsive pains alone operate, she not only holds her breath, but she makes use of the muscles of respiration to fix the thorax firmly, and then, in the most forcible manner, contracts the muscles of the abdomen upon the womb. If she be enjoined to desist from bearing down, she often fails to obey the injunction, because the tenesmus, like that of dysentery, is irresistible. The muscles that she employs in bearing down, after she has fixed the diaphragm and other muscles belonging to respiration, are the rectus abdominis, the external and internal

obliqui, and the transversalis. Now it will be seen, upon the slightest advertence, that while the fundus uteri is high up in the abdomen, the violent contraction of these muscles would have but little effect in forcing the uterus downwards, for it would merely compress the womb against the back part of the abdomen; but on the other hand, when the uterine globe has sunk low down in the belly, that the operation of these abdominal muscles, as agents of expulsion, must become very great and cogent. I have ever found it useless to urge a woman to bear down upon a grinding pain, and always feel it incumbent upon me to cause the nurses and bystanders to desist from exhorting the patient to bear down, in the early stages of labour, an exhortation which they very kindly, but very untimely, never fail to make. Such voluntary efforts cannot be beneficial in their influence on the labour, but they may become pernicious, in certain circumstances, where they not only tend to disorder the sanguine circulation, but very much and very early help to exhaust the strength.

Even leaving out of question the exciting effects of the pangs and agonies of travail, we should naturally expect that the muscular exertions of the parturient subject would greatly accelerate the circulation of the blood, and augment its momentum; and we accordingly find that the pulse grows more and more elevated as the efforts become greater and greater; the heart beats with great violence, and the pulsations amount to one hundred and upwards in the minute; the respiration becomes hurried in proportion, and of course the heat of the body tends to be developed, *pari passu*, with the circulation and respiration; so that fever would soon become intense, were it not that the most profuse diaphoresis, chiefly from the upper part of the body and head, comes on, to prevent the occurrence of what would, otherwise, become a dangerous fever. I have already taken occasion to remark upon this excited state of the vascular system, that it is not to be deprecated except in those instances in which it goes beyond the just bounds; it is, however, always worthy of close observation, in order that its tendency to excess may be checked, by

a free use of cooling drinks ; by ventilation ; by lightening the bed clothes ; by making the patient comfortable in her bed ; removing wet sheets and heated pillows ; by an enema, or purge ; and lastly and chiefly, by the use of the lancet. The state of the mind is also worthy of a large share of the accoucheur's regard. The most cheering and satisfactory assurances that the state of the labour will admit of, should be given, with a due observance of the truth. A woman will be more comforted and composed by being made certain that she shall be delivered in six hours, than by a promise which she does not fully believe, that half an hour more shall put a period to her anguish.

The signs of labour are those which we obtain from simply observing her manner, and from hearing her own account of her symptoms ; or they are such as we obtain from the touch, or examination *per vaginam*. In general, we are accustomed to note, by a watch, the length of the intervals betwixt the pains, and to form an opinion of their intensity, by the gestures or moans, or other complaint of the woman. If the patient have reached her full term, we are commonly free to announce from these points of diagnosis, that labour is begun ; and if, upon making examination *per vaginam*, we find the os uteri dilated ever so little, and the membranes rendered tense during the pains, we may be quite sure that the parturient process hath commenced. The application also of the hand to the abdomen discovers during each pain a hardness and rigidity of the uterine globe, that gives place to a flaccid and yielding softness during the absence of the pain. Such are the true pains of labour.

There are a sort of pains that afflict some women towards the end of pregnancy, which, however severe they may be, and unbearable, are nevertheless very justly denominated *false pains*.

I have many times been kept out of my house all night in order to be near a patient supposed to be in labour, and been refused the privilege of making examination until morning, when after so tardy an admission of my request, I have found in the morning an os uteri perfectly closed, and a still tubulated or cylindrical cervix. So that I

have been obliged to announce, not only that the patient was not in labour, but, that she had not yet reached the full term of pregnancy, by ten days or a fortnight.

It is exceedingly vexatious thus to be baffled by the unreasonable backwardness of the patient to submit to an operation which she knows to be necessary and inevitable; but, we shall in all early stages of labour, except those where the water comes off at the very commencement, be liable to such disappointment and deception, until we verify our other inferences by the infallible method of touching.

The similarity of these false pains to the true pains of labour is very great; there is even to be felt the hardening of the abdomen: but, if carefully examined, it will be found that the rigidity is occasioned by a contraction, not of the womb itself, but of the muscles of the abdomen, that are so constricted upon the uterine tumour as to make even the womb appear to be contracted, whereas it is actually only compressed. False pains, then, are essentially, involuntary contractions of the abdominal muscles. They are, probably, of the nature of tenesmus, and are caused either by the irritation produced by the distended womb, or by intestinal irritation from sordes, flatus, acidity, and other causes that would also suffice, in the non gravid state, to bring on spasms of the abdominal muscles. The difference between those of the non gravid, and those of the gravid state, is, that in the former they are paroxysmal, but in the latter they are regularly periodical, which latter character they acquire from some law that I am unable to explain.

The regular manner in which labour pains recur, has long been the subject of curious speculation. I have not found any writer whose explanation of this periodicity satisfies me, and shall not repeat here for my reader the mere hypotheses which I reject myself. It is enough to state that the contractions increase in frequency and power in proportion as the uterus grows small, or approaches more nearly to the moment of excluding its gravid contents; a most singular phenomenon, which of itself is almost sufficient to refute all the existing hypotheses as to the anatomical arrangement and composition of the

muscular texture of the organ. The observation, however, is perfectly true. In the contraction of the muscles of locomotion or relation, we find that the greatest power of the organ is excited at a point mid-way between elongation and the greatest condensation. Thus the biceps acts with greatest force when the arm is bent to a right angle, and not when it has drawn the hand up to touch the clavicle, or when the arm is fully extended; but in the case of the uterine fibres, if we adopt the common theories, we must admit that the nearer the extremes of the muscular fibres are brought to each other, the stronger do they act. In the case of the uterine fibres, whatever be the cause of the first contractions, or whatever be that of the periodical return of them, both the causes seem to acquire strength by exertion. The weakest pains are those which are met with in women who have the womb enormously distended with water, or with twins; the uterus in such cases seeming to be distended beyond the just limit, and to lose thereby, its tonic or contractile force, a case similar to that which is observed in an over distended bladder, which, as is well known, refuses to act upon its contents, so that, even with the catheter introduced, it is sometimes necessary for the physician to aid the bladder by pressing his hand strongly upon the hypogastrium.

The indisposition to energetic movement in a womb too greatly distended by an excessive quantity of liquor amnii, or by double pregnancy, is for the most part obviated by early rupturing the ovum, and allowing the waters to run off; but even by this practice we cannot always remove a certain lentor or apathy of the womb, which embarrasses the labour very much, nor prevent a troublesome hemorrhage after delivery, the consequence of that lentor: the womb is, like the bladder, when once overstrained by distension, exceedingly prone to relax and fill, and become over distended again; it is inert—
atonic.

When, by the contractions of the fundus and corpus uteri, the child's head hath been forced partially into the

vagina, or through the os uteri, the tenesmus or straining with the auxiliary or abdominal muscles begins, and as I have already mentioned, the whole womb, with its contents, is pushed downwards; under these circumstances, the circle of the os uteri descends very low in the excavation, and its anterior lip may be felt, stretched behind and across the pubic arch, a little below its crown: but as soon as the mouth of the womb is fully opened, and the head completely lodged in the vagina, the lip of the womb ascends, probably, quite to the top of the pelvis in front, and as high as the projection of the sacrum behind—the os uteri encircling the throat of the fœtus with a gentle or moderate contraction. At this stage of the labour, the fundus uteri approaches much nearer the os uteri—nearer by at least four inches, or four and a half, perhaps. When the head escapes from the vulva, the thorax of the child takes its place in the vagina, and at last, as the thorax emerges, the abdomen and lower extremities succeed it in that place, so that nothing now remains in the womb but the placenta and membranes, with a few ounces of blood and water, and the fundus is not more than five inches from the os uteri, instead of twelve inches, as it was at the beginning of labour. The womb is strongly contracted for the last expulsive throe; and if the placenta were not detached, even earlier than this, it could scarcely retain its connection with the uterine surface, now that its superficies is so greatly reduced in size. In fact we do find, in a large majority of cases, that the placenta is pushed wholly or in part into the vagina, by the same pain that forced the abdomen and breech to take that situation; or if it be not thrust out of the womb, it lies loose and detached within the cavity of that organ, and ready to be expelled upon the slightest renewal of contraction, or even by the voluntary expulsive effort of the abdominal or auxiliary muscles. Instances do occur, of a morbid adhesion of the placenta to the womb, in which it is not detached, even for some time after the birth of the child; and I think I have noticed that where the attachment exists at the anterior part of the cavity, it is less apt to be thrown off by the same pains that expel the child. The constricting movement at the fundus is

greater than at the front or back of the womb; hence, a placenta attached to the fundus, is more likely to come off well, than one seated on another part of the cavity.

The separation of the placenta is commonly followed by an effusion of blood. This effusion is inconsiderable in proportion as the action that condenses the uterine tissue, is more energetic and stable. It is supposed that nearly all, if not all, the blood that comes off, flows from what was the placental surface of the womb. Now, as the placenta is from fifteen to twenty inches in circumference, it will occupy a space equal to such a circle, on the womb, before labour begins; but when the womb has contracted so as to be no bigger than two fists, the placental surface of it must be not more than one and a half or two inches in diameter, so that the effusion from its vessels is greatly checked, and, in very tonic uteri, wholly suppressed for a time. If in any case the tonicity ceases to exist, then the womb expands again more or less, and blood begins to flow. It is desirable, therefore, after delivery to have a well contracted womb.

During the whole of this process of parturition, the child is quite passive; if alive, its body possesses a certain degree of firmness and solidity (wanting in the dead *fœtus*) that enables the womb to force it downwards, and cause it to dilate the parts it is destined to pass through: it does not assist itself; as indeed it could not do, with its thighs flexed upon the belly, and the legs crossed perhaps upon the epigastrium, and pinioned by the coats of the womb, which press it together into a compact and passive mass.

At the beginning of labour, the womb acts only upon the ovum en masse; the lower point of the chorion is pressed like a bag into the os tincæ, and protrudes through it and is often burst, and the waters are discharged, before the fundus of the womb comes to press firmly on the child's breech, and to push it downwards. But whenever the fundus uteri does begin to impel the child downwards, it can only do so by acting on the pelvic extremity of the spinal column. The cephalic or

cervical extremity of this column, of course, resists the force, and the spine becomes more arched. It is as if one end of a bow were rested on the floor, and the hand resting on the upper end should press it directly downwards in order to bend the bow. The outward thrust of the arch is in this case so great, that the cervical end of the spinal arch, attached as it is at the condyles of the occipital bone of the child, will naturally thrust backwards and thus raise the vertex and depress the chin; or I should rather say (as the head is downwards), it will depress the vertex and raise the chin, or force it towards the infant's breast. This happens the more readily, as the child's head lies over the pelvic opening, which, so to speak, yawns to receive it.

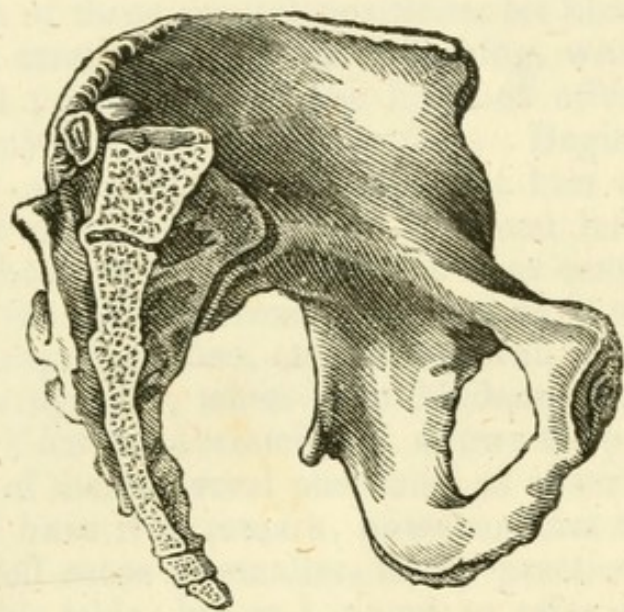
This bending of the neck, or carrying the chin to the breast, is a most important act in the history of a labour; it is called *the flexion of the head*; and when it takes place in due degree, enables the head to descend into the pelvis with very little obstruction; for another change, called the rotation of the head, does not take place well if this first step fails.

I shall beg leave to repeat here some parts of the observations I have made in Chapter II., when speaking of the fœtal head.

The head of a child at term passes very easily into and through a well formed pelvis, provided it present certain of its diameters only to the canal. Now the diameter extending from the child's chin to its vertex is five inches—or five and a half in many children; but the outlet of the pelvis is nowhere more than four and a half inches, at most; of course, the child could not be born should it present such a diameter. Again, the diameter extending from the vertex to the space between the eyebrows, is fully four inches, and often more than that; but from one ischial tuberosity to the other, is but four inches, so that were this cephalic diameter of four inches to be parallel with this bis-ischiatic diameter of four inches, the head would stop, it could not descend any farther. The vertical diameter of the head is however only three inches and a half, which is smaller than any one of the pelvic diameters, so that no great obstruc-

tion can, in any natural labour, be offered by the bones, provided the chin be, early in the process, borne strongly against the breast, so as to make the vertex descend, and cause a considerable dip of the horizontal diameter of the foetal cranium.

The promontory of the sacrum, *as may be seen upon referring to the cut*, juts into the superior strait in such a manner as to turn any rounded body off, either to its right or left side, and accordingly, it rarely happens that either the forehead or the vertex can pass down immediately in front of the promontory ; but, as there is a concavity on each side of it, the vertex, or the forehead, passes down in this concavity, which gives to the head an oblique direction. The forehead, in a majority of instances, goes to the right of the promontory, or in front of the right sacro-iliac symphysis, while the vertex descends below the brim, opposite to the left acetabulum ; not at a fixed point, but either nearer the front of the pelvis, or more posteriorly, as the case may be ; indeed, the child generally is found to bore with its head, so as to turn the vertex now forwards and now backwards, until it becomes fixed in one position at last, by getting under the arch of the pubis. So common is it to observe the child to descend with the vertex opposite to the left acetabulum, that that is taken or counted as the first position of a vertex presentation ; and Baudelocque, whose authority is followed, on this subject, in the United States, enumerates a second, third, fourth, fifth and sixth position, the enumeration or order being founded on the relative frequency of the several sorts, as they are to be met with in practice. Thus the most frequent, according to Baudelocque, is the first position, in which the vertex is directed to the left acetabulum, and the forehead to the right sacro-iliac symphysis ; next, the second position, in which the vertex is to the right acetabulum, and the forehead to the left sacro-iliac symphysis ; the third position, in which the vertex is behind the pubis and the forehead in front of the promontory ; the fourth position, where we find the vertex at the right sacro-iliac symphysis and the forehead towards the left acetabulum ; the fifth position, in which the vertex is at the left sacro-iliac symphysis and the forehead to the right acetabulum ; and lastly the sixth position, where



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the vertex is at the promontory and the forehead at the symphysis pubis.

It is doubtless extremely convenient and proper to reduce all the possible modes of vertex presentations to a small, yet sufficiently comprehensive classification: but the reader, and especially the young student, should remember that all these classifications are human inventions; they are the *proposita* or the *dogmata* of different men; and that, in fact, it is possible for any part of the head to present itself at any part of the brim. If he should further find any difficulty in remembering the order, or application of these several positions, let him make use of such an arrangement as the following, which I have, for several years, been in the habit of offering to my class, in my lectures on Midwifery. Beginning with the vertex at the left acetabulum, let him say, vertex left, vertex right, vertex front; forehead left, forehead right, forehead front. I think this is as easy a nomenclature as the other to remember, and as it explains its own meaning, it is also, on that account, a better one. The following table, taken from Madame Boivin's *Memorial sur l'Art des Accoucheurs*, shows the proportional frequency of these several positions, as observed by that author. I have it to remark, however, that the average of vertex-left cases is smaller, in my practice, than that found in this table; but as I intend to offer some fuller remarks on that point, I feel compelled to defer them to a subsequent page, it being necessary now to proceed with my account of the mutations suffered by the head of the child, during labour.

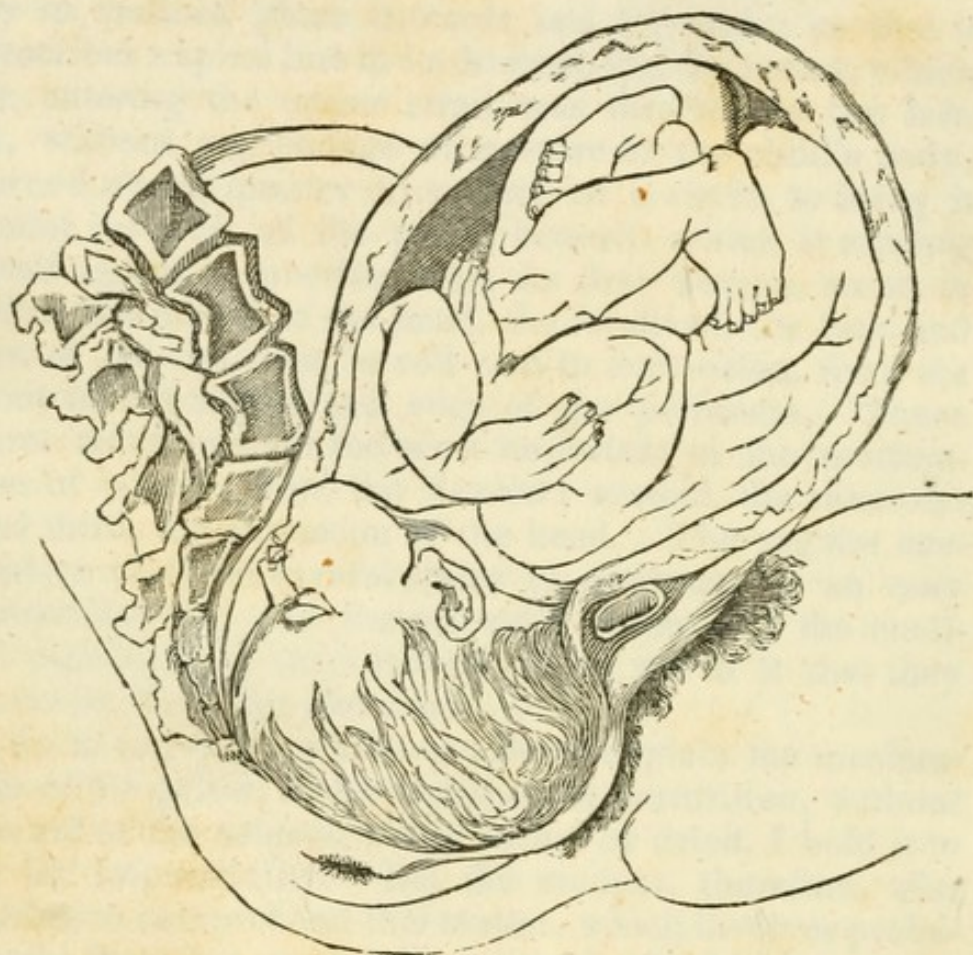
In the birth of twenty thousand five hundred and seventeen children, there occurred nineteen thousand five hundred and eighty-four vertex presentations, of which there were

15,693	in the 1st position,
3,682 2d
6 3d
109 4th
92 5th
2 6th

19,584.

Let the head enter the pelvis obliquely, the vertex being in the first, or vertex-left position—it is not to be understood that the dip of the horizontal diameter of the head will carry the posterior fontanel into the centre of the pelvic canal, on the contrary, such a dip would be too great—and the vertex, or posterior fontanel, glides down along the ischium, repelled by that bone, and directed by its inclined plane inwards and forwards; so that it describes a spiral line in its descent, and the vertex, which on entering the upper strait was directed to the left, is, without any change of posture of the child's body, turned near a quarter or a sixth of a circle, to bring it under the arch of the pubis, beneath which it extends itself again, recovering from its first flexion, so as to allow the crown of the head, the forehead, the face, and last of all, the chin, to roll out, in succession, from the floor of the vagina and edge of the perineum. These three mutations are the most important in the mechanism of labour: first, the flexion; second, the rotation; and third, the extension of the head. The regular succession of these several states is necessary to an easy natural labour; and the principal business of the medical attendant, in such labours, is to see to it that they occur in due order and time.

As to any person's being able to explain the mechanism of the pelvis, or its operation in parturition, without the aid of the subject, either recent or dried, I hold it to be an impossibility. Let the student, therefore, who wishes to comprehend this matter, which involves probably the most important information that he will have occasion for in obstetric practice—let him take a dried pelvis and a foetal cranium, each well and naturally proportioned to the other—let him plunge the cranium into the excavation, holding it in the first position, but without flexion; he will find that it cannot descend very far, on account of the rapid approach of the inclined planes of the ischia below; but if he now turns the vertex somewhat downwards, or brings the chin upwards, it will descend a little further. As he presses it downwards, the same inclined plane of the ischium tends to repel and deflect it towards the pubic arch, in which direction no resist-



ance is offered; if it glance upon the obturator membrane, and indent it, the resiliency of that tissue is sufficient to repel it still more, and still more to deflect it towards the front; in fact, it naturally takes a pivot or rotatory movement, which is greatly enhanced or promoted by the structure of the back and lateral parts of the pelvic excavation, which are so inclined as to repel and deflect the forehead, and cause it to fall into the hollow of the sacrum. Let this experiment be tried both with the dip or flexion, and without it, and it will be seen that in the first case the rotation is almost spontaneous, and in the last very difficult, if not impossible, without extrinsic aid.

The rotation being completed, the vertex is found jutting forth under the arch of the pubis; it emerges more and more, until the occiput, or upper part of the nucha is pressed against the crown of the arch—the further progress of this part ceases—it becomes a fixed point, or an axis, on which the head, as before said, turns or rolls out from the orifice of the vagina, at the close of which evolution the extension of the head is complete.

After the head is born, the face turns again to the side of the pelvis, towards which it was directed at the beginning of labour, or before rotation, and that is called its act of *restitution*.

While the head is undergoing these mutations, the shoulders of the child are entering the basin. In the first position, the vertex is to the left acetabulum, and the right shoulder to the right acetabulum, and the left one to the left sacro-iliac junction. As the shoulders descend, the right one rotates towards the arch of the pubis, and the other falls into the hollow of the sacrum; the thorax is now plunged deep into the excavation, where its further progress is arrested by the floor of the pelvis. A renewal of the uterine effort forces the left shoulder to glide off from the apex of the sacrum and coccyx, and displace the perineum, which it thrusts backwards, until the shoulder is born; the arm and hand are delivered, and retire so far backwards as to allow the right shoulder to disengage itself under the crown of the pubic arch; and the body of the child immediately after-

wards is expelled with great violence, occasioned by the irresistible tenesmus that the woman experiences in this stage, and which compels her to bear down with her whole energy.

A repose of eight or ten minutes follows the birth of the child, and a slight pain, or a voluntary bearing down, expels the placenta and membranes, as before said.

The almost supernatural exertions and struggles of the woman, as well as the painful sensations she experiences, and the novel impressions made upon the nervous system by the successive stages and occurrences of parturition, have brought about a violent excitement of the nervous and circulatory systems of the economy: the former of which is resolved by cries of joy, by tears, and by the delightful sense of security, of finished toil, and the gushing tenderness which the mother feels for her newly born and helpless progeny; the latter rapidly abates, under the effusion of blood, in greater or less abundance, and the abstraction of the stimulus of exertion, pain and dismay. The flood of perspiration gradually subsides, and a short sleep, the best "restorer," soon permits the patient to feel "comfortable," a phrase peculiarly adapted to the case of a puerperal woman. The lochiæ flow in such abundance as to require five or six napkins to imbibe the blood effused during the first twenty-four hours, after which they decrease in quantity, and grow pale, until by the tenth or fifteenth day, many ladies have none but a whitish discharge, which also ceases between the twentieth and thirtieth day.

On the day after delivery the globe of the uterus appears to be larger than it was immediately after the discharge of the placenta; it can generally be felt in the hypogastrium from six to ten days, after which it retreats into the recesses of the pelvis, diminishing daily in size, until, by the end of the month, it is nearly as small as before it was gravid.

Such is the history of Labour, in general terms, which, though it may perhaps afford a pretty good coup d'œil of the phenomena by which it is characterized, is not sufficiently in detail for the purposes of this work; on which account I shall proceed to treat of other particulars in the ensuing pages.

CHAPTER XI.

CONDUCT OF A LABOUR.

THE conduct of a Labour comprises the whole management of a parturient patient, from the first beginning of her pains, until the complete exclusion of the secundines; and it ought also to include all that is done for the security of the mother and the child, during the period immediately ensuing the birth. As labours are extremely various in their characters, as to duration, pain, facility or difficulty, the title at the head of this chapter is an important one, and fruitful of topics, which, if properly handled, could not fail to prove interesting and instructive to whatsoever reader might desire, under such a head, to seek for useful, and indeed I might say, indispensable information.

Any person meriting the name of obstetrician may be supposed competent to the conduct of a natural labour, where the series of phenomena proceeds with rapidity, and in a perfectly natural order of succession and duration, provided he will remember the oft repeated adage, "a meddlesome *midwifery* is bad;" and be, therefore, willing to abstain from impertinent interferences. A kindly providence has so ordered this painful office of parturition, that the accoucheur, in most cases, hath really nothing to do except to receive and protect the child, and attend to the delivery of the after birth, extending his care to the disposal of both the mother and her offspring for the first few hours after the termination

of the labour. To show what the proportional number of unassisted or natural labours is, to those that require the aid of science or skill, I may state that out of twenty thousand five hundred and seventeen children born at the Hospital de la Maternité, for the time under the care of Madame Boivin, only three hundred and thirty-four required to be assisted, leaving twenty thousand one hundred and eighty-three children that came into the world by the natural powers dedicated to the office of parturition. The time required for the completion of the process of childbirth, may be learned from the following little table taken from Dr Maunsell's Dublin Practice of Midwifery, 1834. Dr M. states that in eight hundred and thirty-nine cases occurring at the Wellesley Institution,

347 terminated in 6 hours,

300	.	.	.	12	.	.
87	.	.	.	18	.	.
52	.	.	.	24	.	.
37	.	.	.	48	.	.
3	.	.	.	56	.	.
5	.	.	.	60	.	.
1	.	.	.	72	.	.

Although it will appear from the foregoing statements that women generally are found capable of helping themselves, yet every labour is not a natural one, nor is every natural one an easy one; and, where the deviation is at all considerable, much reflection and prudence are required in order to prevent a natural labour from becoming laborious, difficult, or actually preternatural. Were it so that all the cases of parturition should end favourably, and pass easily, there would, certainly, be no occasion for medical interference, and we might lay down our vocation and take up a less disagreeable one: but the facts happen not so: hence, when it is protracted through many successive hours of apparently fruitless suffering, the sufferer loudly claims that something should be done for her relief, and compels the medical attendant to employ such arguments and exhortations as may serve to reassure and compose her, or else adopt some real or pretended measures for relief, or for accelerating the birth.

That practitioner confers a real benefit on his patient, who, by a proper degree of candour, or the evident possession of confidence in his own knowledge or skill, either convinces the patient that the time is not at hand for intervention, or that, when the time shall arrive, all the needful judgment and dexterity will be employed for her security. A woman may utterly fail of all her courage and firmness, and so, by falling into a despairing or fretful humour, greatly retard and embarrass the parturient processes, to that extent, indeed, as to render some manual operation necessary, merely because she has lost faith and trust in her attendant; whereas she shall recover a great, and indeed a sufficient degree of power, immediately upon the appearance of some other person either celebrated for his professional abilities, or exhibiting in countenance and manner the evidences of confidence in himself, and in the resources of his art. The young practitioner, who sometimes permits his own disappointment to affect, in any degree, his remarks or his gestures, exerts a very injurious influence upon his patient. He ought under all circumstances to retain a perfect command over his feelings; and, above all, to be in full possession of the most accurate theoretic knowledge, at least of the processes about to be perfected, and of the measures that are indicated in their several stages, whether they occur in the natural order and manner, or whether any thing arise to interfere with or obstruct them. Such a practitioner will rarely lose the confidence of his patient, no matter how severe or protracted her sufferings may be. He will support her spirits and hopes with his steady and confident assurances of relief in due time, and thus prevent the mischief that ensues, where the mind, distracted with pain, fatigue and dismal fears, carries disorder into all the functions of the body. Nothing conduces more commonly to the production of the very uncomfortable state of things, now alluded to, than the making of rash promises or prognostics. No one can know beforehand when a labour shall be terminated. If the first stages proceed ever so favourably, the latter may give the greatest possible trouble, and any failure of a prognostic cannot but di-

minish the woman's reliance upon the ability of her attendant. No good practitioner makes them. Let the student of midwifery, therefore, early resolve to avoid all the difficulties which arise from such great imprudence.

Few women go through labour without a very great acceleration of the pulse, and increase of its force and volume. This excitement is sometimes attended with the development of nervous symptoms, in such a degree as to require measures for its diminution. When carried to a certain extent, an increased activity of the circulation is very advantageous; it develops in the nervous system, both cerebral and ganglionic, a vast increase of energy which is acknowledged and responded to by every part of the constitution, particularly the circulatory system, and serves to hasten the arrival of the happy moment of release, by augmenting the expulsive energies of the womb, to the vigorous and regular contractions of which, a somewhat elevated state of the vital forces seems requisite in almost all cases. It should not be interfered with, then, except under peculiar circumstances: as, for instance, where it occasions severe head-ach, mental excitement verging towards delirium, or tremors and irregular action of the muscles, carried to an unsafe extent. The excess of excitement ought to be removed in such cases: in order to prevent it from passing into debility and exhaustion, the constant results of a great excess of it; and more especially, to obviate the danger of convulsions, apoplexy, and other accidents to which the human constitution is obnoxious under violent excitements or efforts. I have in a great many instances observed, that the pains have fallen, or become irregular and spasmodic, in consequence of this constitutional irritation, and that they have recovered their vigour and co-ordination by removing the excess of bed-clothes, bathing the hands, face and throat with cool water, and by the exhibition of cooling drinks, together with free ventilation of the apartment. In cases where

these would not suffice, I have scarcely failed to re-establish the regular course of events by taking blood from the arm.

Notwithstanding that most women have a very greatly increased frequency and force of the pulse, during the more active stages of labour, it is not universally the case ; some females passing through the whole process without any change whatever in the rate of the circulation.

The following case was under my care on the 9th of February 1828. Mrs B. aged twenty-five years, in labour with her first child, was attacked with the pains at seven o'clock A. M., and was delivered at twelve o'clock of a healthy female infant. The whole amount of blood discharged at the separation of the ovum did not exceed three ounces. The pulse was very slow throughout the labour, not exceeding *sixty-five pulsations per minute*, even during the most violent expulsive pains. Some time after the complete expulsion of the secundines, the os uteri was two inches in diameter, and hard and smooth as a ring of ivory.

I could cite many cases from my practice in which the pulse was quite unaffected throughout the whole process of parturition.

Professor Dewees has been justly celebrated for the boldness and good judgment with which he has resorted to venesection, in some cases of labour. The quantity drawn by him, in instances which he has reported, although, doubtless, fully demanded by the exigences of the time, and justified by the results, may, nevertheless, have induced some persons of lesser powers of discrimination, to resort to a similar mode and extent of depletion ; hence it is not uncommon to hear of very large bleedings, of thirty or forty ounces at a time, during labour. I must aver, that I think such very large abstractions of blood not often necessary, and would, therefore, take this opportunity to warn the reader to discriminate carefully, in making up his judgment concerning the quantity to be drawn in each particular case. For example, where the woman has become too much excited, as to her circulation, in the manner above pointed

out, I have no idea that it is necessary to draw away a great quantity of blood. Let him not bleed, then, to use a very common phrase, until the pulse is soft. He does not want a soft pulse. In labour, or at least in the violent stages of labour, the pulse ought to be full, vigorous, and somewhat accelerated. If he bleeds, then, till the pulse becomes soft, he will substitute for a state of excitement and excessive power, one of debility and looseness, quite as much to be deprecated.

The design of venesection, in the instances I at present propose, is to take off the strain—to mitigate the general stimulation which ensues upon too rapid a revolution of the blood. I therefore think that it is better, for the most part, to limit our bleedings, for these general purposes, to something under, rather than beyond sixteen ounces. But, on the other hand, where symptoms, strongly threatening, of apoplexy, convulsions, pulmonary hemorrhage, inflammation, &c. make their appearance, the lancet should be used in the most fearless manner. The same is true of those cases where a great relaxation of the tone of the tissues is required for some special and pressing object, such as the relaxation of a strictured vagina, of a very rigid uterus, the removal of a violent congestive or inflammatory accumulation of blood in the brain, &c. &c.

It is difficult to conceive of an individual who, when under high excitement, whether from fever or other causes, doth not experience a considerable diminution of that excitement, upon the operation of an aperient or cathartic medicine.

The facility and promptitude with which the alvine discharge can be effected by means of enemata, renders a resort to them of very common occurrence; and, in fact, where only a slight reduction of excitement is wanted, they answer the end proposed very fully; yet a dose of some neutral salt, of magnesia, or castor oil, may be beneficially administered, in instances where there is a promise of sufficient time for the alvine ope-

ration to take place before the delivery of the child. Aperient doses are the more evidently indicated, in labour, because it cannot be doubted that the constitutional disorder brought on by the pain and fatigue of labour, must, in some measure, extend to the digestive organs: nothing is more common than to meet with parturient patients who vomit very much; while water brash, heartburn, and sour eructations are also exceedingly common, and often quite distressing.

The foregoing remarks tend to show not only that medicines of an aperient kind are frequently indicated in obstinate and protracted labours, but they also show that great care is required as to the exhibition of food to such patients. Some food is wanted, particularly for those whose pains are of the lingering kind, and allow the process to remain unfinished for many hours. For the most part, tea, bread or gruel, sago, &c. are what is found to suit the patient best. The best drinks are gum-water, toast-water, lemonade, cold water, and such articles as these; the object here, being to sustain the system by means of nutriment, while under severe effort, at the same time that we carefully avoid calling that effort in the direction of the digestive organs. The whole powers of the economy should, therefore, be husbanded and preserved, in, as much as possible, their normal condition, in order that they may be directed and determined towards the womb and its auxiliary organs. In the case of a very slow labour, which should be unattended with constitutional symptoms, or any evidences of gastric disorder, a light broth, or even some small portions of very digestible meat, might, upon due reflection, be allowed to the patient.

The attitude of the patient exercises, in many circumstances, a notable influence on the progress of labour. It is the almost universal custom, in this country and in England, to direct the woman to lie upon her left side, with the knees drawn up; a posture which is highly convenient, and productive of the least possible exposure.

But where the labour proceeds slowly, the heat and the pressure occasioned by lying still, under such circumstances, are highly injurious. The woman ought, therefore, to be directed to turn on her back, or even on to the opposite side, or to rise and sit in an easy chair, from time to time. I do not recommend that they should be too much urged upon this point; but I remark, that the influence of custom is so great, that a proposition to turn on the back is not unfrequently received here, with something like astonishment and aversion by the bystanders, who seem to regard that attitude as one of indelicacy, at the least. Hence it is proper to assign reasons for the request.

In cases where the retardation arises from an improper direction of the expulsive forces, it is of the highest importance to direct the patient as to her attitude. For example, if a lateral limb of the os uteri can be felt towards the middle of the pelvis, and the other one is either out of reach of the finger, or very high up on the side of the ischium, it will be found that the fundus uteri is directed to one side of the abdomen, giving more or less obliquity to the long axis of the womb, and of course an oblique line of direction to its forces, which are decomposed, or partially nullified thereby.

On Sunday, November 30th, 1828, I was sent for to visit Mrs C., whom I found lying upon her right side. The pains seemed so expulsive, that when I arrived, I expected to receive the child immediately, for she bore down like one in the last throes of labour. I requested her to turn upon the left side, informing her that that position was the most convenient for me. She did so. The pains now became inefficient, and partook, in appearance, of the character of the grinding pains. I found that the uterus had obliqued far down to the left side, as soon as she turned over, which interfered with the due exercise of its power. She was again placed on the right side, which brought the womb into its proper line of direction, and the labour ended, after three or four pains. The same consequences follow from an anterior obliquity of the axis of the uterus; but in this case the anterior limb, or lip of the womb, seems to hold the head as in a

sling, the anterior ridge of the orifice being stretched across the head, quite towards the middle of the pelvis ; whereas the posterior edge of the circle either cannot be felt at all, or is felt high up towards the promontory of the sacrum. It is evident, that in such a state of things, a good deal of power must be lost, in pushing away the anterior part of the cervix, which should be preserved, or more usefully employed in other efforts. We are advised, in order to remove the difficulty, to draw the os uteri forwards towards the symphysis, and retain it there by the fingers ; but there is a rudeness and violence in this plan, which will be easily understood by such as shall make the attempt, and who, moreover, will often find that they cannot retain it in the desirable place, without exerting so much force as to expose the os uteri to contusion or rupture. If the woman lies on her back, the fundus uteri will retire towards the spine, bringing its axis into the proper range ; and of course the plane of the os uteri will take its proper station : a child will, in some instances, be delivered much sooner if this precaution be taken, than if it be omitted.

When we meet with patients who allow themselves to be violently agitated by the pains of labour, so as to require actually to be held, at a period when the perineum is in danger of rupture (and women are now and then so distressed as to lose all command of themselves), the best attitude is the one on the back, with the knees drawn up : in this position they are kept much stiller and quieter than when on the side. I had a woman under my care in November 1833, who actually was so violent that two or three women could not keep her still ; when I caused her to assume the dorsal position, she became passive enough.

I have spoken, in another place, of the dip of the occipito-frontal diameter of the foetal head ; the nearer to the middle of the excavation we find the posterior fontanel, the greater is that dip. But where the fontanel is found quite up towards the side of the pelvis, and the anterior fontanel is at the same time within reach of the finger, we may feel assured that the dip has not taken place, and the retardation of the labour may safely be

attributed to that cause. Could we, under such circumstances, get the vertex down, or more towards the centre of the pelvis, the pains would be more successful. Now, as the edges of the parietal bones over-ride the edge of the occipital bone, they form a ledge which gives a good purchase for two fingers, which, when applied upon that ledge, are generally enabled to draw the vertex downwards to the required position. Whenever this operation is to be attempted, it should be tried during the absence of the pains; and when the vertex is once pulled downwards, it ought to be retained in its place until a new pain comes on, and thus enables the operator to secure whatever advantage he has gained. Should the head be placed, by this gentle method, in the desired attitude, it is as easy to conceive, as it is indeed common to witness, the increased facilities it affords for the delivery.

I have always found it much easier to pull the vertex down than to push the forehead up, because the finger, acting upon the ledge above described, does in reality act upon the longer end of the lever, of which the atlas represents the fulcrum; whereas, in an attempt to push up the forehead, so situated, the lever we use is very short, its real extremity would be the chin; but we cannot reach that part; moreover, when we attempt any strong force, the bones of the os frontis are so yielding, that they are readily indented, and we are obliged to desist for fear of contusing the brain; the fingers, in fact, being applied near the upper edge of the os frontis, where the ossification is as yet very incomplete. The same objection does not hold as regards the posterior edges of the parietalia, and os occipitis, which are very firm before birth.

The labour may be retarded by the failure of the head to undergo *rotation*. It is sometimes very difficult, at the bedside, to learn wherefore the head does not rotate, in a patient, who, in another labour, meets with no such

difficulty. I am aware that it frequently arises from failure of the dip above spoken of; but I wish now to speak of a case in which the head has sunk very low, where the dip is good, but yet the rotation fails. I have on many occasions, after much doubt and anxiety upon this subject, found that it could be fully accounted for, by referring to the grasp of the cervix uteri, which actually bound and held the head so firmly, that it was unable to execute its pivot motion. The remedy, in such cases, is patience; for as soon as all resistance of the cervix is given up, in consequence of the fatigue of the parts, or the acquisition of a perfect dilatability, the pains push the head down, and the inclined planes of the pelvis cause it to execute its spiral or rotatory movement in the most rapid manner.

In all the cases where the rotation fails for want of the requisite dip, or approach of the chin to the breast, let that want be supplied by pulling down the vertex as directed. It must be admitted that such gentle measures will not succeed always, but we have, then, the powerful resource of the whole hand, which may be introduced into the vagina, and taking the head in its palm and fingers, can place the vertex wherever it may be desirable to fix it. It should be remembered, however, that a vectis is, very rarely, but imperatively, demanded for the management of such a case.

The obliquity of the womb, which can, by vitiating the direction in which its forces act, greatly retard the progress of a labour, may also be a cause of failure both of the dip and the rotation of the head. Suppose the breech of the child to lie very low down in the right flank of the patient; if the vertex be to the left side of the pelvis the dip will be very difficult to effect, and the rotation in consequence must fail. The remedy is to correct the obliquity by changing the position of the woman. It is easy to conceive, that if the vertex remain directed still to the left, and the breech could be now thrown far down to the left, the dip would be very much facilitated. I have on many occasions reaped the benefit of attending to this point.

The head has sunk low into the excavation; the fontanel is in the proper position, neither too near to, nor too far from the symphysis: but it advances not at all; pain after pain passes over, with great suffering to the mother, and yet with no sensible advance of the head. What can occasion the retardation? The finger passes up behind the symphysis to the superior strait, and moves along the linea ileo-pectinea, a considerable distance, showing conclusively that no disproportion exists between the head and the bony canal it is destined to traverse. All uneasiness of mind on the practitioner's part, will cease as soon as he discovers that the cervix uteri, which he had thought to be sufficiently dilated to offer no farther considerable opposition, has ceased for a time to yield, and takes hold of the head during every pain, in such a manner as to prevent the parietal protuberances from escaping into the vagina. The proper remedy here, also, is patience; a small venesection; a large draught of some warm relaxing fluid; the fortunate occurrence of nausea; a careful adjustment of the axis of the uterus, and of that of the pelvis; or perhaps a few very powerful exertions of the auxiliary muscles, in bearing down, to which the woman can be exhorted. I have often, after allowing myself to get into a fret relative to the slow progress of affairs, found all my uneasiness dissipated by a more careful examination; thus, as above, clearly ascertaining that no other than soft obstruction existed; whereas, from too careless an examination, I had been erroneously led to believe that the os uteri had mounted upon the parietal protuberances of the foetal head, and that some unknown cause of retardation existed.

The hollow of the sacrum is the essential cause of the specific properties of the excavation. Those properties will be present in perfection, where the sacrum is per-

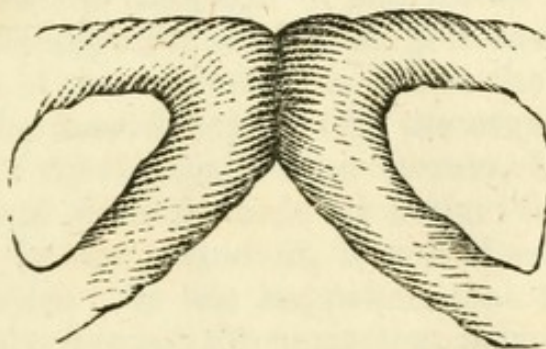
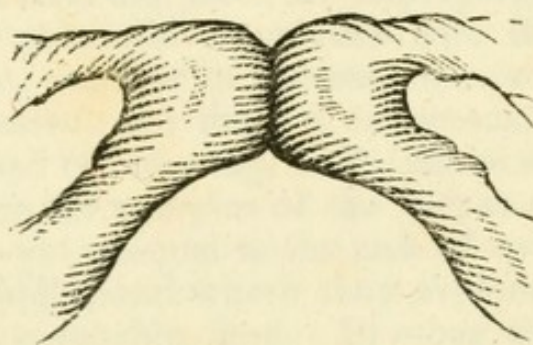
fectly well formed and adjusted: but the sacrum may be either too little curved or too much so. I have specimens of both kinds of deviation. Inasmuch as the rotation of the head requires, for its regular and easy performance, a good curve in the sacrum, it is striking, that a very straight sacrum must offer considerable impediments to that important act. Hence, a sacrum with too little curve, will protract the period of delivery; and in fact, a case might arise, and such a one has arisen, where no rotation at all could take place, but where the delivery, at last, must occur without this important part of the mechanism of labour—the vertex coming out under the tuber ischii: a case requiring the very extremest degree of flexion of the head. Let the student reflect a moment, and he will perceive what process must be substituted for the rotation. The occipito-bregmatic diameter is but three and a half inches, but the tubera ischii are four inches apart; hence, where the rotation fails, there must occur a greater dip, causing the occipital fontanel to take a position nearly in the centre of the pelvic canal, by which the relations of size between the head and pelvis are restored, and the occipital bone is enabled to pass out under the ischium, and the parietal protuberance under the pubal arch. Such a great degree of dip may be greatly promoted by the help of the fingers, as before stated, but it will take time. It is not very difficult when the head is of a medium size.

On the other hand, if the sacrum be too much curved, its apex will jut forwards towards the pubis, so as to form a sort of shelf, on which the head lies, the expulsive forces being, for a long time, vainly expended in impelling the head down upon this shelf or ledge. The gradual compression of the cranium, however, at length moulds it into the requisite form, and allows it to slide off the ledge, and the delivery takes place. It is to be understood, that very aggravated degrees of this vicious conformation involve the necessity of direct interference, with some one of the various instruments employed in obstetric operations.

When the pubal arch is not low, but retains the character of early life or of the male pelvis, it happens

that great retardation takes place ; because the act of extension of the head cannot take place in due time. Such a narrow arched pelvis compels the head to continue its descent much longer than one where the arch is broad and low. It has as bad an effect as, and indeed it is equivalent to, a long symphysis pubis ; for in the ordinary conformation, as soon as the occipital bone can come to apply itself to the arch, the vertex begins to rise ; extension of the head takes place ; the perineum requires no inordinate degree of protrusion : but, imagine a pubic symphysis of two and a half inches, instead of one of an inch and a half, and it is plain that the perineum must go farther down before the head can escape under the arch. A patient with a very narrow arch has been under my care in two of her labours, in which the natural pains being insufficient, I was compelled to augment them by the ergotic stimulation. By violent efforts of the womb and abdominal muscles, she gave birth in both cases to living children. I need not say, in self defence, that I waited as long as I deemed it prudent to do so, but my confidence in her strength was vain in each instance.

The resistance of the perineum and vulva are so great, in many women, as seriously to retard the delivery. I have waited six hours by the bedside, after the vertex has begun to jut out between the labia, the patient all the while suffering severe labour pains, which vainly tended to expel the head. In such cases there is nothing to be done but wait patiently, after having placed the patient's constitution in its proper attitude, by means of venesection ; by the least fatiguing posture of the body ; by the application of mucilaginous fomentations to the genital region ; by the exhibition of relaxing drinks, and by the warm bath. I consider that we have no right to apply a force, additional to one that nature furnishes, and which it is evident must be effective if left to itself. Under such perverse resistance of the soft parts, time is required to *enable* them to acquire a yielding temper. To force the head through them by the ergot or the forceps, would be to incur the hazard of shocking lacerations of the external organs of generation,



or even of the womb itself, which it is rashness, in the highest degree, to stimulate and lash into fury, in cases where the uterine contractions are already very powerful, and where they would soon effect the delivery, were it not that the external parts are unprepared to admit of it. The true principle of practice here is, to diminish the resistance, and not to increase the power, already perhaps excessive, and therein dangerous. Let me be fully understood as referring, in the above remarks, only to cases where the energies of the uterus are great and manifest, but yet unequal to the task of overcoming the resistance rapidly, and where they evidently will overcome it in a reasonable time. In other circumstances, as where the resistance is powerful and the pains poor and weak, let the just proportion be established, by means of the ergot, a glass of wine or the forceps, between the power, and the resistance it is destined to vanquish.

When, at last, the head begins to emerge, it does so by pushing away the perineum before it, which continues to cover the cranium like a tight cap. It should be remembered that the direction of the forces is parallel to the axis of the superior strait; but it is equally true that the direction of the movement is not in the same line, at this stage; the head is repelled by the curved line of the sacrum: it is driven against the sacrum, but glides off from its curved plane towards the outlet; from which, if unrestrained by the perineum, it would escape without much extension. It has happened that the head has passed directly through the perineum, perforating it as if a six pound ball had passed through it, without injuring the commissure of the vulva, or the sphincter muscle of the anus; and there is supposed, always, to exist some danger of its tearing the anterior edge of the perineum, at least, when that point is unsupported. Hence the general care of writers to direct that the perineum be supported.

From the foregoing remarks, the student will be enabled to appreciate the value of this injunction concerning

support to the perineum, and to know how it ought to be executed. A towel should extend from the lower part of the sacrum up towards the top of the vulva, and be pressed against the parts in such a manner as to protract or continue the inclined plane of the sacrum, whereby extension of the head will be enforced, and no danger occur of its being too strongly propelled against the now thin tissues, which might be lacerated were the head not to follow the curved line of its movements.

The degree of pressure made by the hand must be proportioned to the exigences of the particular case. It should be always sufficiently great to cause the head to undergo extension, at least; and, where the tissues yield with difficulty, so as to furnish grounds to fear their laceration, the further advance of the head may be safely counteracted, for a time, by pressure, which should be continued until the soft parts acquire dilatability.

The young practitioner, and the student, should be warned against falling into a habit of beginning too early to support the perineum. If the part be too early pressed upon with a napkin, it might become heated, and thus lose its disposition to dilate: and it is assuredly not necessary to sustain it, or support it, until so great a degree of extension has taken place as puts it in some danger of being lacerated.

The head is born: perhaps the cord is turned once, or even more than once round the child's neck, which it encircles so closely as to strangle it. Let the loop be loosened, by pulling the yielding end of the cord, sufficiently to enable it to be cast off over the head. This cannot always be done: if so, in any case, let the child pass through it by slipping it down, along its body, over the shoulders. If it seem impossible to slip the cord over the head or shoulders either, it should be let alone; and in a great majority of cases it will not prevent the birth from taking place, after the occurrence of which the cord can be cast off. Should the child seem to be detained by the tightness of the cord, as does rarely happen, or in danger from the compression of its jugular vessels, the funis may be cut with the scissors, and tied after the

delivery. Under such a necessity as this, a due respect for one's own reputation should induce him to explain, to the bystanders, the reasons which rendered so considerable a departure from the ordinary practice indispensable. I have known an accoucheur's capability called harshly in question upon this very point of practice.

If the shoulders should not rotate, so as to bring one of them under the arch, that motion may be given by one or two fingers, introduced, and made to act upon the shoulder nearest the pubis, so as to draw it into its proper place. If difficulty occur, and the shoulder does not advance, press the child back against the edge of the perineum, and that will often afford room for the advance of the shoulder, which had been thrust over the top of the brim of the pelvis by the resiliency of the edge of the perineum. I have sometimes caused the shoulders to descend immediately, by merely pressing the perineum downwards and backwards—the child, whose shoulder was jammed up above the top of the symphysis pubis, slipping down behind the symphysis, as soon as the cause that pushed it forwards (*viz.* the pressure of the perineum) was withdrawn. Sometimes the shoulder nearest the sacrum, and at others that nearest the pubis escapes first. The student will, in practice, readily perceive which one he ought to assist; he will at times be compelled to try one, and then another, being uncertain which is likely to emerge first.

It is considered bad practice to drag out the body, except in very particular circumstances: the womb and abdominal muscles are sufficiently powerful for that object; and if it be permitted to come away slowly, we shall have a more complete contraction of the womb, and a more ready detachment and extrusion of the placenta. Therefore, it is better to leave the expulsion of the body to nature, merely removing any cause of delay, that may obviate its descent and escape. Where the delay is great, and the child becomes very black in the face, and the respiration is either not established or in an unpromising condition, we are fully warranted to expedite the delivery by making use of one or more fingers, fixed as a blunt crotchet in the axillæ.

As soon as the child is born, lay it on its back, out of the reach of the waters, which sometimes stand in a deep puddle by the breech of the mother—the child ought never to be exposed to the danger of suffocation. If it breathes regularly, it is well; if not, blow suddenly into its face, and drop some cold spirit upon the region of the diaphragm. These and a few smart frictions are, in general, all that are demanded. The cord should not be cut until the pulsations have ceased near its placental extremity: it would be vain to wait for its cessation near the child's body, as doubtless blood is thrown into the arteries long even after the ligature is applied; in fact, children do sometimes bleed at the cord hours after they have been dressed, if the cord have been imperfectly secured. There is no need to tie the cord twice, unless there be twins; which can always be ascertained by feeling for the uterine tumour. Tie only one ligature, and that at the distance of an inch or two from the belly, and cut the navel string, holding the cord tightly betwixt a finger and the thumb. If it be not held, it will spurt the blood sometimes to a good distance, and soil the bed, or even the practitioner's clothes. Conceal the cut end of the placental portion of the cord in the napkin with which the perineum has been defended, in order that its blood may not fly over the bed; and then, give the child to the nurse. There is danger of dropping the infant if it be not properly taken hold of. It should be seized with the left hand, by one or both ancles; the back of its neck ought to rest in the arch formed by the thumb and forefinger of the accoucheur's right hand, while its back lies in his palm, and the points of the remaining three fingers are under its right axilla. If held in this manner, it can by no means fall to the ground. I have seen a child taken hold of under the arms by both hands, and lifted up in a manner I thought quite insecure, considering that it is slippery with the waters or blood from which it had just been taken up.

In most cases the placenta comes away in eight or ten minutes—Dr Hunter thought in twenty minutes. The care required in regard to the placenta is considerable; for no one can say, of any labour, that it will end well,

until the afterbirth is completely discharged. The French call the delivery of the placenta, emphatically, *delivrance*, delivery. We ought always to ascertain, after having given away the child, what is the state of the womb. Therefore place a hand on the hypogastrium, and if a hard tumour be felt there, the womb is contracted; if the womb is either not to be felt at all, or is very soft and yielding, a few gentle frictions on the abdomen will cause it to contract; and now if a finger be passed up to the os uteri, the afterbirth will be either felt in it, or just above it; if in it, let the woman bear down immediately, while the cord is tightened by pulling moderately at it. The mass will descend slowly into the vagina, either edgewise or not; if not edgewise, one edge may be hooked down with the finger, and a few efforts of bearing down will expel it from the vulva. It should be received in the left hand, and turned or twisted round several times, in order that the membranes may be gathered into a string or rope, so that, when they are drawn out, none of them need be left adhering to the uterine surface, where, by detaining portions of blood, they might give occasion to putrefaction, with offensive and injurious discharges. A complete, clean delivery ought always to be effected, if possible. If the woman finds, the next day, that portions of membranes are hanging out of the vulva, she becomes alarmed, or at least thinks her medical man careless or ignorant. Notwithstanding that the placenta may be carefully twisted, as above directed, we sometimes find that where the membranes have been very much broken by the child, or where they are extremely delicate, the cord we have formed by twisting them is breaking, so that a considerable remnant of them is about to be left in the uterus, which we cannot get possession of without passing up the hand at least into the vagina. My custom, when I find the membranes breaking, is to cease pulling until I have wrapped them in a small rag, which enables me to twist them still more, and thus draw them entirely away. Now they are so slippery that they cannot be twisted with the fingers, but when a dry rag is wrapped round them we can

twine them and pull them as much as we may think needful.

It unhappily does not always befall that the placenta comes away soon : we may wait half an hour or an hour for the expulsion of the afterbirth, and yet upon examination, repeated from time to time, discover that it has not come within reach of the finger. Frictions upon the abdomen are known powerfully to excite the peristaltic fibres of the alimentary canal ; but their effects upon the womb are far more decided : it may be said, that when made upon the hypogastrium, they generally compel the womb to recommence its contraction—some women are so excitable that a touch brings on the afterpains ; they ought, therefore, to be instituted. The consent of parts, also, causes the womb to act sometimes, as soon as the woman makes a strong bearing down effort, to which she should be urgently prompted, if needful. When a contraction has been procured by frictions, or in any other way, it may be rendered permanent by pressure ; therefore let an assistant be properly taught to apply the palm of the hand over the uterine globe, and not take it off until told to do so. In all those patients who habitually flood in labour, this caution ought to be obeyed. When the hand is removed, a bandage ought to be ready to occupy its place. If the os uteri be very much closed, it is probable that the placenta will require a long time to come away ; and I know no objection to a patient waiting for the spontaneous movement of the organ, where no hemorrhage or other unusual appearance is observed. Some writers have been disposed to assign a fixed period, up to which the accoucheur ought to wait, before he resorts to compulsory measures for the delivery. But there can be, or ought to be, no fixed rule on the subject, except this one rule, viz. the placenta must be got away, as there is no security while it is left. I have never gone away from a patient leaving the placenta undelivered. I think I have never waited for its spontaneous extrusion more than an hour and a half, for I have always supposed that if it would not take place in one hour, there was little prospect of its taking place in twenty-four hours. I cheerfully admit, however, that cases may and do

occur, in which a longer delay might be advisable. I have not met with such cases. I wish to be understood as speaking, in this place, of the placenta retained *in utero*, and not of cases where it is partly expelled into the vagina; for, when in the vagina, I think there can be no necessity of waiting at all; it ought to be removed at once. Ruysch, the celebrated Dutch anatomist, zealously inculcated the doctrine, that, as the expulsion of the placenta is a natural office, it ought not to be interfered with, except upon the occurrence of symptoms making such intervention indispensable; and his authority having been deemed unquestionable, was yielded to by several physicians of eminence, who nevertheless found, after losing not a few patients from hemorrhage, inflammation, &c. the consequence of retained placenta—that experience is the best teacher; and they therefore reverted to the custom of securing the expulsion of the secundines by artificial measures, wherever the powers of nature were incompetent to that function.

A placenta will weigh from a pound to a pound and a half. Let the student reflect that such a mass, if within the uterine cavity, must distend it considerably; and if he cannot touch it by passing the finger up to the os tinæ, the fundus of the womb must, of course, be high up within the abdomen. Therefore, in any case of retained placenta, he will find the fundus perhaps fully as high up as the navel. It will require, then, in order to get it, that the *hand* should be introduced: the finger cannot reach far enough.

From the dilated state of the vulva and vagina, after delivery, no difficulty stands in the way of the introduction of the hand into those parts. As it passes up it is guided by the forefinger, which glides along the cord, while that is tightened by the other hand. The reader must expect to find instances in which the os and cervix uteri actually gripe the cord; and that he will be, in such a case, necessitated to introduce only one finger at first, then a second, and a third, which gradually conquer the resistance of the circular fibres of the os and cervix uteri, so as to make way for the whole hand, which at length is found to have entered into the cavity of the womb.

But the pressure required in this operation has put the vagina, even the womb itself, on the stretch; so that were he not to resist its rise by pressing the abdomen with the other hand, the fundus would be pushed up to the scrobiculus cordis, and his arm pass inwards as far as the elbow. In general, it appears to me that the uterus, in retained placenta, contracts by its circular or horizontal fibres, while its longitudinal contraction does not take place at all. It is, indeed, extremely common to feel the womb, like a large intestine, pretty firmly contracted as to its transverse diameter, while from the fundus to the os uteri the length is not less than before the commencement of labour. Certainly it must have happened to many practitioners to make this remark of the cases in which they were obliged to introduce the hand, for the extraction of the placenta. Let the operator, therefore, always stop the womb from rising, by counteracting it with one hand placed on the abdomen, over the top of the fundus, in order to push it downwards towards the hand which is within. Most probably the placenta is to be found partially detached; if not, let the detachment be effected by getting one or two fingers under its edge or circumference, and thus peeling it off from the womb, taking great care not to use sudden and indiscreet force, so as to hazard the leaving any of its lobuli in the cavity of the womb. Whenever all the adhesions are certainly overcome, the mass should be grasped in the hand, which may then be gradually withdrawn, holding the obnoxious placenta in its grasp; or, if the womb is suffered to push the hand out, so much the better. This operation it has been my fortune to be compelled to perform a good many times; and I can safely say I have never seen any bad results from the practice. It may be done so gently and dexterously, as even to occasion but little pain.

The cord furnishes a most convenient means of pulling out the placenta, but should never be used for that purpose without a very careful reflection on all the circumstances. If the afterbirth is still attached, and the uterus firm, to pull at the cord is to endanger the breaking it off even with the surface, which is an embarrass-

ing and rather disgraceful accident; but if the womb be not firmly contracted, it is so flaccid, that, like a wet bladder, it may be turned inside out. I have seen a womb that was turned inside out by a midwife in this way, a case of great interest, that will form the subject of a future page. To any individual who has seen a womb at full term, nothing would seem to be easier than to invert a relaxed uterus. Wherefore, no man of discretion ought to draw by the umbilical cord, without having first ascertained that the womb is well contracted; and even then, the force he may venture to employ by its means is an exceedingly limited one.

When the placenta is delivered, the hand should be soon placed on the patient's hypogastrium, for the purpose of ascertaining whether the uterine globe is firm. It ought to feel through the integuments about as large as the fist; but there is great diversity in regard to the magnitude of the organ immediately subsequent to delivery. The smaller it is the better for the patient, who, with a well contracted uterine globe, may be safely pronounced beyond the reach of danger from effusions of blood; or at least, from effusions that can with propriety be denominated uterine hemorrhages.

Inasmuch as the pains of labour alternate with intervals of rest or inaction, it follows that the pains which women suffer, whether before or after delivery, depend upon one and the same cause, viz.—the alternate action of the womb. The organ, after delivery, grows alternately small and large for some hours; expanding to double the size of the fist, when the pains are off, and reducing itself to the smallest size when they return. Every interval, or moment of expansion, permits a small quantity of blood to accumulate in the cavity, which is soon forced out by the returning pains. The woman feels the gush of warm fluid issuing from the vulva, and is very apt to say that she is flooding or flowing. An inspection of the countenance and an examination of the pulse are perhaps sufficient to indicate the course of the practitioner. If the face is not pale, and the pulse not weak or small, he will be sure she is not bleeding too freely; but if they indicate the existence of too considerable a dis-

charge, the amount of it ought to be ascertained with the most rigorous precision. There are few nurses who are competent to decide upon the nature of the discharge; as whether it amounts to what might be denominated hemorrhage or not. I was called in haste to attend a woman whom I found just delivered of a child; I received the afterbirth, which came off spontaneously, and observed that the sanguine discharge was very great, but the woman although feeble was not sunken. The uterus contracted well, and I left her in a comfortable and usual state. In about two hours I was summoned again, and found her very faint, with extremely feeble, slow pulse. Placing one hand upon the hypogastrium, I found the womb not dilated, and then inquired of the nurse as to the amount of the lochia. She assured me that it was not greater than it should be. She had examined carefully into the circumstances and found all right. Distrusting her account, I determined to learn for myself whether a large effusion had taken place, and found an immense quantity of coagula lying upon the bed, which the nurse had either not seen at all, or disregarded. This case, which afterwards caused me great trouble and anxiety, has influenced me ever since, and now I always feel unwilling to take information at second hand upon the important subject of profuse uterine discharges. I think it the duty of the student early to resolve to learn accurately whatever may have an injurious or dangerous tendency for the patient to be committed to his charge.

It may be stated as an axiom in obstetrics, which has almost no exception, that a well contracted uterus cannot bleed; and all obstetricians habitually feel secure when they find the organ hard and of a small size. Nevertheless the state of contraction may soon be followed by so absolute a relaxation of the contractile forces of the uterus, that the gentlest infusion of blood into its cavity is capable of distending it again, if that fluid be prevented from escaping at the os tinæ or at the vulva. But if a coagulum should fill the vagina, and stop the mouth of the womb; or if the napkin should be too strictly pressed against the genital fissure, preventing

the escape of fluid therefrom, the blood which flows into the womb will gradually distend it to that degree, that, without losing a spoonful externally, the woman may effuse enough blood into the uterine cavity to expand it very greatly, and to cause fatal syncope. I was called about three years ago into the country, to assist a practitioner in a difficult labour. When I arrived, the child had just been delivered with forceps. The placenta was adherent. After waiting a sufficient length of time for its spontaneous extrusion, I removed it, and the womb contracted well. In the course of half an hour my attention was attracted by a sort of gurgling sound from the bed, which caused me to draw near to the woman, whom I found already quite fainted away when I approached her. She was very pale, and the pulse could not be felt at the wrist. The discharge was inconsiderable; but on placing the hand on the hypogastrium, the womb was found enormously distended, and full of blood. Two fingers were now carried into the os uteri, which was found to be tamponed with a very firm clot. This I broke up and brought away, when out rushed a large quantity of grumes, mixed with fluid blood, and the womb returned to its proper dimensions. She had no return of the symptoms. I could cite many examples from my case book, of violent hemorrhages, both concealed and open, which have fallen under my notice in females where the uterus had contracted perfectly well after the delivery of the placenta. One case is so remarkable that I cannot resist the inclination to publish it here.

Mrs S. was delivered of her first child after an easy labour. She had a very good getting up, and on the fifteenth day walked down stairs. Some words of an unpleasant character passed between her and her husband. She became violently excited with anger; then burst into tears, and ran up stairs, where she threw herself on the bed. She was shortly after found in an apparently dying state. When I reached the house there was no pulse; great coldness, and the greatest degree of paleness. I found the womb filled with blood, and reaching above the umbilicus. Dr Dewees was so kind as to visit this patient with me, and assist me with his

valuable counsel. She recovered, but suffered a long time under the symptoms produced by this excessive sanguine discharge. This case will show the student that even where the uterus has contracted so much as to sink down below the superior strait, it may be afterwards enormously distended by influent blood; and the reflection arising from it, though an unpleasant one, is a very just one, that even where we succeed in getting a good contraction, we can have no sense of absolute security against concealed or open hemorrhage, in a patient whom we may have put to bed ever so comfortable, and apparently safe.

The influence of position in determining the momentum of blood in the vessels is well known to the profession; but there are few cases where it is of more consequence to pay a profound regard to this influence, than in parturient women. A uterus may be a good deal relaxed or atonic, and yet not bleed, if the woman lie still, with the head low; whereas, upon sitting up suddenly, such is the rush of blood down the column of the aorta, the hypogastriacs, and the uterine and spermatic arteries, that the resistance afforded by a feeble contraction is instantly overthrown, and volumes of blood escape with an almost unrestrained impetuosity. The vessels of the brain under such circumstances become rapidly drained, and the patient falls back in a state of syncope, which now and then proves immediately fatal.

In conversation with my late venerable friend Professor James, upon this very subject, he informed me that, he delivered a lady a few years since, after an easy natural labour. The uterus contracted well, and all things seemed as favourable as possible. As the accouchement took place early in the morning, he was, subsequent to the event, invited to breakfast downstairs, whither he proceeded, after having given strict caution to the lady on the subject of getting up. While the persons at breakfast were conversing cheerfully, and exchanging felicitations upon the fortunate issue of affairs in the lying-in room, the nurse was heard screaming from the top of the stairs, "Doctor, Doctor, for God's sake come up!" He hastened to the apartment, and the lady was lying across the bed quite dead. It was found that,

soon after the doctor went below, the lady said to the nurse, "I want to get up." "But you must not get up, madam, the doctor gave a very strict charge against it," replied the nurse. "I do not care what the doctor says," rejoined the patient; and thereupon arose, and throwing her feet out of the bed, she sat on its side a few moments, reeled, and fell back in a fatal fainting fit. The remarks of Dr James, as he related the occurrence to me, have made upon my mind, a deep impression of the vast consequences of careful, and well timed instruction of the nurses; who, if they could have the dangers of mismanagement fully exposed to them, would surely avoid some accidents that every now and then are attended with very shocking results.

Large discharges are not apt to occur when the womb has once contracted pretty firmly. But there are precautions which ought always to be observed: *e. g.*

I left a woman half an hour after the birth of her child. She was as well as could be desired. I gave the usual directions. In a short time her husband came running to me, in the street, where he met me, and said his wife was dying. Upon hastening to his house I found her, in fact, pulseless, pale, and completely delirious; with a constant muttering of incoherent phrases. Upon inquiry, the following occurrences were found to have taken place. She felt some desire to pass the urine. The nurse told her to get up. "But the doctor says I must not get up." "Oh, never mind what the doctor says, it wont hurt you; get up." A chamber-pot was placed in the bed, and Mrs F. was lifted up on it, in a sitting posture. She fainted in the woman's arms, was held up a short while, and, when laid down, the vessel was discovered to be half full of blood. She had nearly died; and did suffer long and severely in consequence of this impudent disregard of orders. When I left her, the uterus was well contracted; but the change of momentum in the arterial columns produced the hemorrhage, than which, I have scarcely seen one more dangerous.

It is of the highest consequence to secure a powerful contraction of the womb after delivery, in all those women who have suffered severely from floodings, occur-

ring soon after the birth of the child. A lady in three successive labours, of which the first occurred on the 30th of December 1819, and the last on the 28th of September 1824, which were rapid and easy, was brought almost to the gates of death by enormous discharges, which commenced about five minutes after the birth of the foetus. I saw her lie pulseless, and as near as possible to dissolution in those labours. In two subsequent confinements, she took one scruple of ergot, just as the foetal head began to emerge. This was given to her, not for the purpose of aiding in the expulsion of the child, or placenta, which had never occasioned any embarrassment in antecedent labours; but, by constricting the womb permanently, to save her from those dangerous losses; and I am pleased to say, that in both instances, she experienced none beyond the ordinary amount of effusion. I could cite numerous examples of similar results.

I repeat the opinion already expressed, that the blood that issues from the placental surface of the womb ought to be permitted to flow freely out from the vagina. After it is effused it is of no use to the woman. What is the reason that a woman does not bleed to death after the placenta is detached? It is not because a coagulum is formed, by which the effusion is arrested. She is saved by the condensation of the uterine tissue, which is not only sufficiently diminished, in volume, to close the small orifices of the vessels on the placental surface, but even, to close the largest sinuses that may be opened during the cesarian section, or in extensive lacerations of the womb. I repeat again, that a very firm clot, shutting the mouth of the womb, may serve as a tampon which shall wholly prevent the escape of blood from the cavity, which expands as it continues to receive the effusion, until the womb becomes fully as large as at the sixth month. Such clots should be broken up, and removed. They are as dangerous as, but not more so than, the artificial tampon, when used after delivery at term. I have never used a tampon after delivery at term; but I have seen one used, which came very near causing the patient to sink, by detaining the effusion within the ca-

vity. The principle is false, and the practice dangerous, which resort to such a mode of arresting uterine hemorrhage, at term. If it should be said, here, that women very commonly do discharge utero-morphous clots after delivery, I admit the fact; but I subjoin, that but for a sufficient degree of irritability in such uteri, the clots would become so large as to require for their formation, a wasteful, and even dangerous or fatal extravasation of the vital fluid. Strong uteri never permit them; weaker ones allow considerably large ones to be formed, and very feeble wombs fill until the woman faints or dies.

I attended Mrs J. A. S., confined with her fifth child, in a labour that was perfectly natural, relatively to the birth of the child, the delivery of the placenta, and the symptoms that immediately ensued the parturient state.

Having waited about half an hour, I took my leave of the patient about two o'clock in the morning, and had proceeded a good way towards my house, when I was overtaken by her husband, who entreated me to hasten back to the lady, as she seemed near dying.

Upon returning to the house, I found my patient without pulse, the face of an excessive paleness, and the whole state expressive of the last degree of sinking or prostration. The idea that immediately became obvious was, that, she must have had a large effusion of blood: but upon placing the hand on the uterine region, the organ was found well condensed; while, upon careful examination of the bed, no very considerable extravasation of blood was detected. I found that the abdominal parietes were very remarkably flaccid; to such a degree as to strike me, forcibly, as affording incompetent support to the viscera within: indeed, the contractility of the abdominal muscles and integuments was so very slight, that it appeared to me the bowels could have derived almost no support from their pressure.

After exhibiting such restoratives as were at hand, I folded two large towels into squares, and placing them upon the abdomen, as compresses, secured them by a

bandage, which retained them in situ, and thus afforded such a degree of support to the contained viscera, as I deemed sufficient to obviate the sinking and fainting tendencies, which always ensue from a loss of this support or pressure. I enjoined rest in a horizontal posture, removed the pillows from under the head; and when the forces of the constitution rallied, there was no further alarm or distress. It has happened to me many times to meet with this syncopal state, after delivery, unaccompanied with hemorrhage, either internal or external; and in all parturient persons, who are enormously distended, or who are prone to such faintings after delivery, I take the precautions suggested by the above case in good time; and can safely say, that, such precautions generally result in success.

The effect of a removal of pressure or support from the contents of the abdomen, is noticed not only in labours, but in tapping the abdomen for dropsy. It is always deemed necessary, in very distended persons, to pass a broad roller round the abdomen, so as to constrict it in proportion as the water flows off. In cases of paracentesis, where this precaution is not observed, the patient is very apt to faint, and evidently from the same cause I have mentioned, viz. the want of pressure on the contained organs. I had occasion, more than two years ago, to verify this principle in a case. A young woman, excessively distended with ascites, was tapped; the water flowed off very rapidly: in proportion as it escaped I tightened the bandage, and she made no complaint of faintness. In order to test the effect of relaxing it, I withdrew all pressure for a very short time, the water still flowing, and she immediately began to grow sick and faint; which symptoms ceased as soon as I renewed the pressure with the bandage. It is with the greatest confidence, both as to its necessity and efficacy, that I therefore recommend, that, a bandage should be early placed around the abdomen of such patients as are prone to fainting after delivery, as the compression, all things being ready prepared, may be applied soon after the birth, without disturbing the patient.

The diet of a woman recently delivered, ought to be very light, and of easy digestion ; tea, bread, gruels, vegetable jellies, and panada suffice, and are the safest materials during the three or four first days of the accouchement. Circumstances may demand a more liberal allowance ; but, for persons who have small lochial evacuations, or who are of an excitable constitution, the simplest elements of nutrition only should be prescribed. For a surgical patient, both before and after the completion of the operation, a regimen is deemed of vital importance ; and yet the shock to the constitution, and the irritative influences of the wound, in severe or capital operations, are not greater than those developed by many instances of labour. In addition to these considerations, it ought to be remembered that during the months of gestation, the fluxional determinations have been towards the uterus ; but now the wave of vital fluids is marching towards another set of organs, and great disturbances are, many times, occasioned by this mutation of directions. The effort of the constitution produces fever, which commences simultaneously with the irritation of the mammary glands ; but, happily, when those glands are enabled to throw off an abundant secretion, the whole constitution is relieved by the evacuation, and the fever suffers a crisis, as well marked as that of a bilious, remittent, or any other febrile disorder, that goes off by a profuse diaphoresis or diarrhœa. Let the body, then, be prepared for this fever, by a correct course of diet ; and when that crisis has been completed, much of the hazard of an accouchement will be already overpassed, and a reasonable indulgence in stronger food become safe and proper.

The child should be put to the breast as soon as the mother has recovered sufficiently from her fatigue and exhaustion. This is a natural course—it is, therefore, the

best one ; for by the act of sucking, the new determinations, about to arise, are invited to, and restrained within their proper bound : the vital wave ought to come hitherto, but no further. Such a course is useful for the child, which generally procures, from the earliest lactation, some saline fluids, that have a favourable influence on its digestive tube ; and for which ought not to be substituted that pernicious compound, molasses and water, which every child in the country is doomed to swallow, at the expense of a sour stomach and flatulent bowels, displayed in the almost universally resulting symptoms of colic, green stools and vomiting. The antediluvian mothers had no molasses and water for their children, who lived, nevertheless, a thousand years. Nothing can be more, certainly, conformable to the dictates of nature, than an early application of the infant to the mother's breast. If we could suppose a woman in a state of nature, to be delivered alone, under the shade of some native forest, and unsuspected, observe her conduct, we should witness the instinctive movements and promptings of nature, that would far better guide us in the management of such affairs, than the crude conceptions of those, who are ever ready to boast of the excellence of art or skill, over the calm suggestions of uninitiated nature. Such a mother would soon be aroused from the weakness and languor that succeed the pangs and throes of childbirth, by the cries of her helpless offspring. She would take it, as soon as a little returning strength should permit, into her arms, and the newly born child would probably not nestle a moment on the maternal bosom, without finding the source of its future aliment : the very anatomical structure, both of the maternal arms and breast, and the instinctive motions of the child's head, would bring its lips speedily in contact with the nipple. But we, wiser than our great instructress, often keep the new born child away from its natural resting place, and deprive it of the most appropriate nutriment, for two or three days, in order to eschew sore nipples, or to propitiate some other imaginary evil ; while we allow the breast to fill almost to bursting, and actually to inflame from distension, before we admit that preparation to be com-

plete, which our presumptuous interference, in this manner, vitiates and troubles. The child ought to be put to the breast as soon as the mother is strong enough to take it.

I need only refer the student to what I have already said, concerning the injurious effects of sitting up after delivery, to bear me out in the opinion that a lady ought to keep her bed several days after the birth of her child. In general, on the third day, she may get up to have her bed made, and thenceforth may rise daily, provided all the circumstances of her situation are favourable.

It is a good custom to give an aperient medicine on the third day, or about seventy hours after delivery; while, in most cases, it is safest to defer the administration, at least up to this period. The perturbations of vital action in the abdominal viscera, occasioned by medicines administered too early, are observed to result in symptoms of congestion, and of peritoneal fever, in not a few instances, particularly where an epidemic tendency to the latter malady exists.

It should be well understood in the lying-in apartment, that no medicines are to be given to the mother, or the child, without the sanction or advice of the medical attendant. In our part of the country, it is exceedingly common for the nurse to take upon herself the function of prescriber, and to administer a dose of severe cathartic medicine, upon her own responsibility; which, however great and sufficient she may deem it, remains, after all, with the physician. He it is who bears the burthen, and undergoes all the trouble and anxiety, and responsibility of the management. He ought, therefore, always to direct that no interference with his rights should be suffered to take place. There are many reasons why he should be the sole director of the management; for it is not a matter of indifference what particular article

is selected, any more than it is of little consequence, at what moment the medicine (if any) be administered.

Castor oil is the article in most request, for this period of the confinement ; and in a dose of half an ounce, operates sufficiently well. Where the castor oil is particularly disagreeable, a proper quantity of magnesia and rhubarb ; of infusion of senna ; of epsom salts ; of seidlitz powders, may be substituted ; but, in general, the oil is to be preferred, in consequence of the great certainty and moderation with which it operates on the bowels.

The lochial discharges grow gradually less abundant, and of a paler colour. The tone of the womb itself must determine, in a great measure, the duration and amount of the discharge. It disappears in the third week, and sometimes, earlier. Not a few women continue to have a show in the fifth week ; and, in fact, the Jewish women had their purification at the fortieth day, which probably might be founded on observations, as well suited to the inhabitants of this country, as to those of the Holy Land.

CHAPTER XII.

FACE PRESENTATIONS.

IN those cases wherein the usual dip of the occipito-frontal diameter fails to take place, but, on the contrary, is reversed, so as to allow the chin to depart far from the breast, the head is actually turned over backwards, and permits the child's face to fall down into the pelvis. These are what are denominated Face Presentations ; a sort of labours, that are thought less unnatural and dangerous, now, than in former times. I am clearly of opinion that face cases may well be included among the natural labours, except some failure in the powers of the woman should cause us to convert them into preternatural ones, by obliging us to turn and deliver by the feet ; to restore the vertex by some serious operation ; or to extract with the forceps.

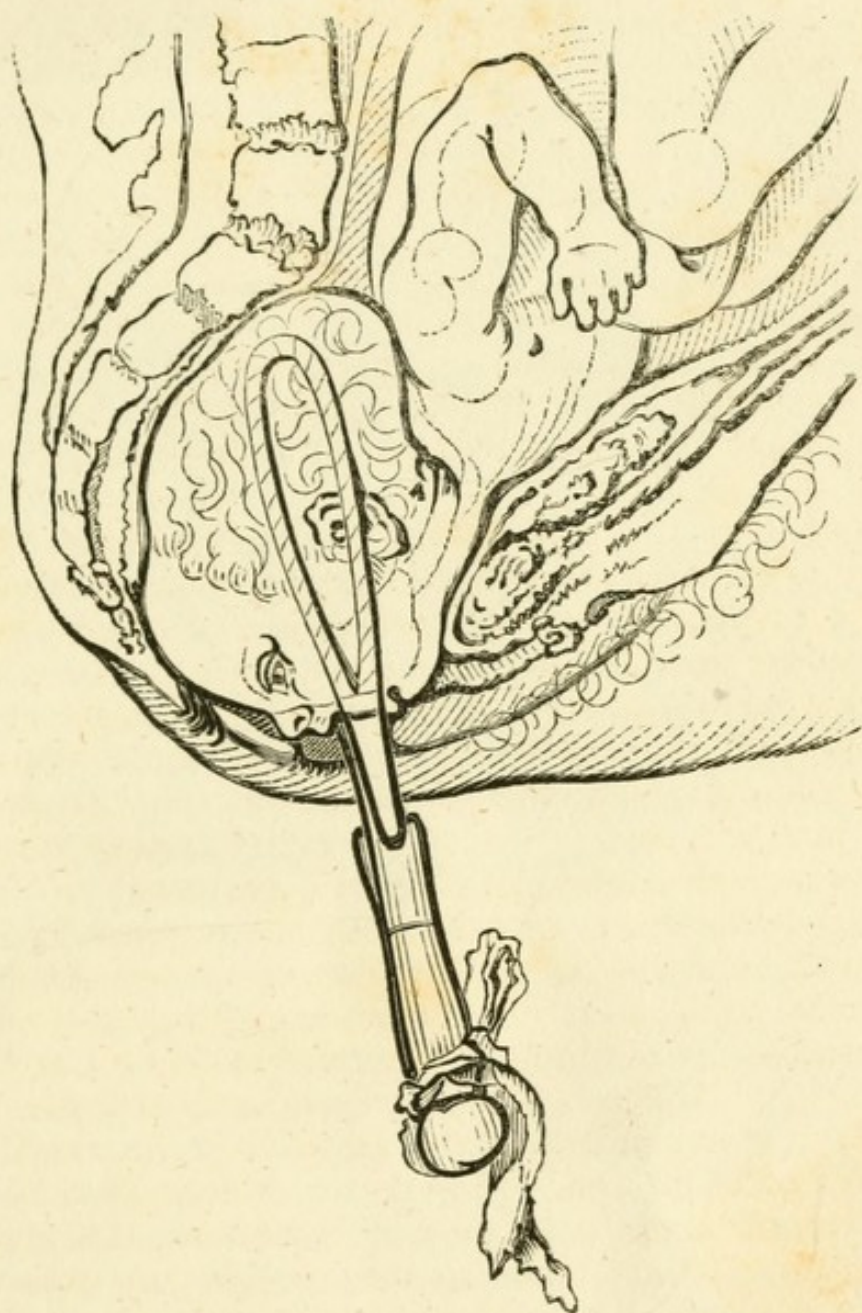
The foetal head is an oval, which is five inches long, from the vertex to the chin, and three and a half inches wide, at the widest part ; and it ought to make no difference, as far as the mere head is concerned, whether the chin or the vertex advances first in labour, because, in either case, the same circumferences of the head are presented to the parts through which they are to be transmitted. The foramen magnum of the occipital bone being nearly equi-distant from the vertex and chin, and situated on one side of the oval, the peculiar difficulties and hazards of these labours are attributable, rather, to the nature of the articulation by which the neck and head are conjoined,

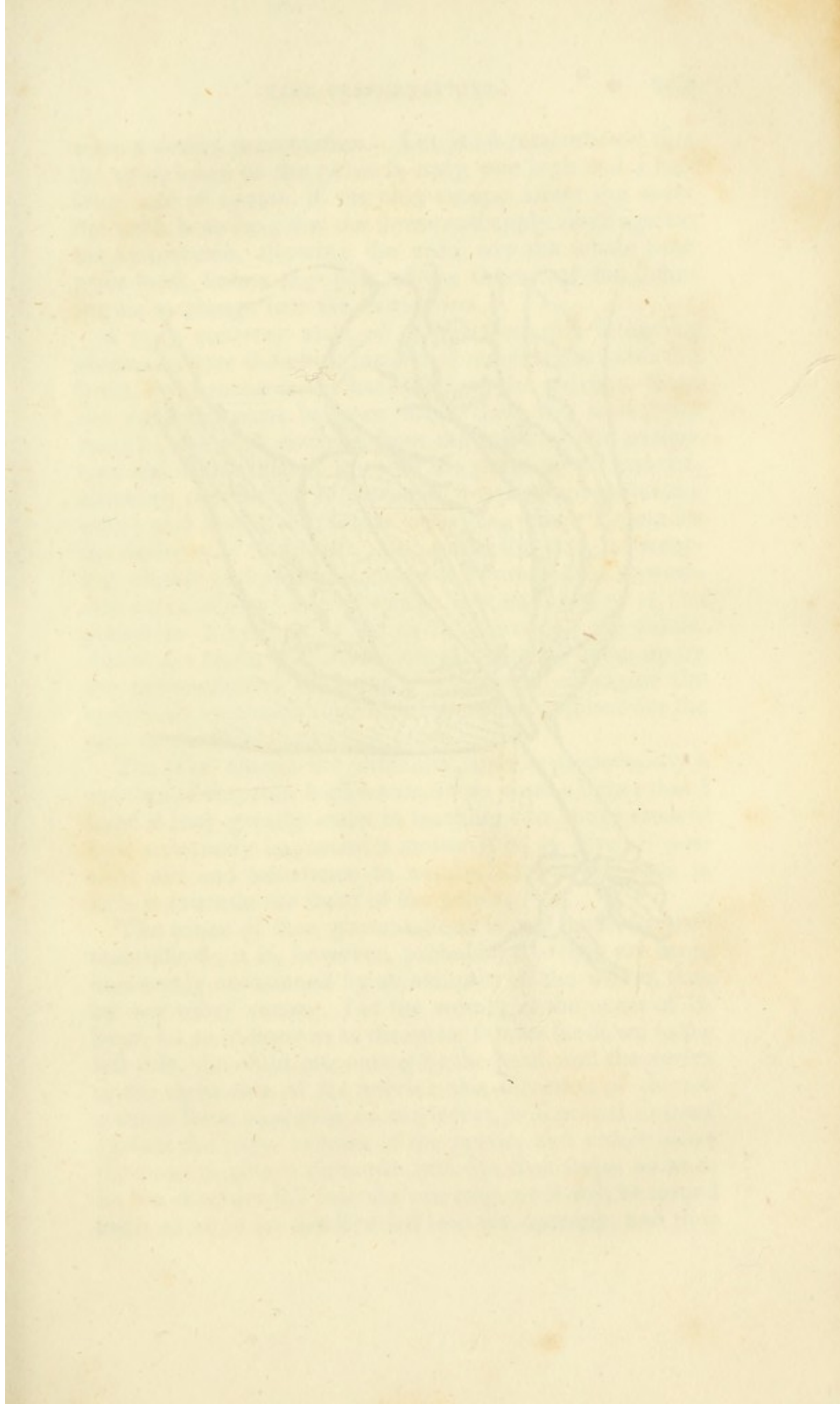
than to the form of the head itself, when advancing with the face downwards. The nature of this articulation is such, that extension of the head cannot take place so well as flexion : hence the requisite dip of the occipito-frontal diameter is not effected without difficulty, and the consumption of much time.

Let the reader figure to himself the state of the spinal column of a child, urged on, in labour, by powerful uterine contractions, directed to its expulsion with the face in advance. The inferior-posterior part of the head is pressed against the back of the neck, or betwixt the scapulæ, which could not be the case, without bending the cervical spine backwards, like a bow, while the dorsal and lumbar vertebræ are curved in the opposite direction, causing thus a double antero-posterior curve, on which, in consequence of the elasticity of the two arches, much of the expulsive force is vainly expended ; so that, though the power may be great as common, it produces much less effect than common ; a great part of every pain being occupied in reproducing, at each time, the greatest amount of curvature (for the elasticity of the two curves is such, that they are straightened as soon as the pain subsides, at least in some measure) ; and the rest of the pain is used in pushing the face onwards.

The direction taken by the face, as it proceeds, in such a labour, is worthy of the closest attention of the practitioner. If the chin enter the superior strait near to the acetabulum, it will afterwards rotate towards the arch of the pubis, and, escaping under that arch, will rise upwards over the pudendum, so as to allow the throat to be applied to the arch, while the remainder of the head is evolving itself from the os externum. In such a birth, the part that first emerges is the chin ; then the mouth, the nose, the forehead, the crown ; and, last of all, the vertex, which escapes over the fourchette, when the flexion of the head immediately becomes complete. *See the Cut.*

This is the most favourable direction for the face to take, and it will generally be found that a well formed pelvis is capable of transmitting a child of moderate size, almost as speedily and safely, in such a labour, as if it







were a vertex presentation. Let it be remembered that the symphysis of the pubis is only one inch and a half long, and of course, if the chin escape under the arch, the neck is so long that the throat can apply itself against the symphysis, allowing the chin, nay the whole head to be born, before any part of the thorax of the infant begins to plunge into the excavation.

A very contrary state of things from the foregoing obtains, where the chin, instead of revolving towards the front, turns towards the back part of the pelvis. Here the forehead must be born first; then the nose; the mouth; the chin escapes from the edge of the perineum, and then retreats towards the point of the coccyx, allowing the crown of the head to pass out under the arch; and lastly, the vertex emerges, which concludes the delivery of the head. But, while the chin is sweeping, slowly and painfully, down the curve of the sacrum, and especially when it is got so low as the edge of the perineum, the breast of the child is entering the pelvis, where the space it should occupy is already taken up by the perpendicular diameter of the head. Imagine the enormous extension of the os externum, required for the exit of the child, in such a case!

The *Cut* shows the difficulty, that is produced by a rotation of the chin backwards, in so clear a light; that I hope it may greatly assist in teaching the young student how extremely important a matter it is, to give all possible aid and assistance to nature, in her attempts to turn it towards the front of the pelvis.

The cause of face presentations is not perfectly well understood; it is, however, probable, that they are more commonly occasioned by an obliquity of the womb, than by any other cause. Let the womb, at the onset of labour, be so oblique as to throw its fundus far down to the left side, the child presenting by the head, and the vertex to the right side of the pelvis: the direction of the expulsive force operating on the infant, will propel its head against the edge or brim of the pelvis, and either cause the head to glance upwards into the iliac fossa, so as to let the shoulder fall into the opening, or it will be turned over, so as to let the face fall into the opening, and thus

produce a face presentation, in which the chin is to the left acetabulum, and the forehead to the right sacro-iliac junction. It is easy to set this in a clear light, especially if it be accompanied with demonstrations on the *phantome*.

In my opinion, it would be right to admit, in a systematic arrangement, only two original positions of face presentations ; viz., one with the chin to the left, and one with it to the right of the pelvis ; it being always understood, that the position is not necessarily exactly transverse, but that the chin may be variously situated, sometimes being so far back as to be near the sacro-iliac symphysis, and sometimes more anteriorly, or near the body of the pubis. By admitting these two positions only, the student's mind is relieved from the burthen of unnecessary artificial distinctions ; and should he in practice rest upon them, it will be easier for him to comprehend the practical doctrines relative to the case. Thus, in all face cases, the great doctrine is to bring the chin to the pubic arch ; and there are two positions, in which the chin naturally tends to the arch, if the position be just and good ; or it may tend to fall into the sacral curve, if it be not just and good. Suppose we were to make four positions : 1, Chin to right sacro-iliac symphysis ; 2, Chin to left sacro-iliac symphysis ; 3, Chin to left acetabulum ; 4, Chin to right acetabulum ! What good result would we obtain, since, in all these cases, there will be found very great differences ? for, in the first, the chin may be more or less near to the sacro-iliac symphysis at one time than another, in some instances being nearly transverse, and in others not quite so far backwards. If we adopt all four positions, we must have a doctrine for each ; but with the two only, there is a necessity for only one doctrine—viz., bring the chin to the arch of the pubis, if practicable.

Face presentations are accidents ; and, perhaps, they are so unlikely to happen, that, they ought to be regarded as examples of preternatural labour. Yet, when we come to reflect, that the female can expel the child with but little more difficulty, in this case, than in vertex positions, it seems altogether proper to regard them as natural

cases. But I have said that they are accidents, and I believe that they are chiefly caused by deviations of the axis of the womb. If a female have a very great right lateral obliquity of the womb, and the vertex present towards the left side of the pelvis, it may be impelled against the brim in such a manner as to glance above it, and allow the forehead to fall into the opening, which state could not exist long without being followed by the descent of the face. It should be observed here, that, from the chin to the vertex is a distance of five inches, which none of the diameters of the strait will take in, in the living subject : therefore, if the vertex should rise above the brim, and let the forehead fall into the opening, the chin would gradually come down. Let not the student then expect to find the face looking full down into the excavation, at the beginning of these cases, but rather, let him expect to find it coming more and more completely down as the labour draws to its close.

Suppose a case of face presentation to be caused by a right lateral obliquity of the womb, the head being repelled above the edge of the strait : the womb, in its oblique state, leans to the right and *forwards*, and not directly towards the right ; whence, if the accident occur in the manner supposed, the chin could not fail to be placed to the right, and a little forwards ; the same thing is true of cases caused by left lateral obliquity—*mutatis mutandis*—as before stated. This furnishes a striking manifestation of the wisdom which, in giving form to the pelvis, even provided us herein a remedy for the accidents that might occur to thwart or prevent the parturient act. Should the chin be towards the posterior part of the pelvis, and not susceptible of being directed towards the front of the body, the most serious mischiefs might be expected to occur ; whereas, when the chin advances towards the pubis, little embarrassment is, in general, to be apprehended.

If we could know, antecedently to the descent of the presenting parts, what they are, it might be supposed that we could easily restore them to their proper situation, when wrongly placed ; but, while the presenting part of the child is above the brim, it is very rare to have such a good degree of dilatation as to admit of the hand being

introduced, in order to effect the needful changes. The womb opens as the part comes down. Hence, when a face case is ascertained to exist, it is mostly (I say not universally) too late to return it into the abdomen or superior basin; and as for bringing down the vertex, after the head has once sunk well into the excavation, I regard it as a rash, if not an impossible act; rash, since it could not be done without very great violence; and generally, impossible, since we cannot turn, or seesaw a diameter of full five inches, in a pelvis furnishing less than that space. Where it is possible to push the whole mass back, and bring down the vertex, let it be done.

Dead, and half putrid children, in whose tissues there is scarcely any resiliency or resisting power left, are not so unapt to come face foremost as living children, in whom departure of the chin from the breast occasions such a great extension of the head as to be painful, whence the child opposes the wrong tendency, by acting with all its strength, to get the chin down, or the head flexed again.

Let me repeat that it is not to be expected, that, at the very beginning of a labour, the face of the child shall be found looking directly downwards. It is the forehead that is first felt; and the face itself does not appear in the excavation for some time after the commencement of the parturient throes. The head turns over only by degrees, and allows first one eye to be felt and then the other, the nose, the mouth, and the chin. In order to exemplify these processes, I shall cite some cases from my record-book.

On the 5th day of February 1830, I was called to attend Mrs ———, in labour with her second child. When I reached her house, it was half past six o'clock in the morning. She told me that she had had pain for a day or two, but was seized with regular labour pains at four o'clock this morning. Upon making examination per vaginam, I found the os uteri from one inch and a half to two inches in diameter, with the edges thin and very ductile, and the membranes were protruding through them very tensely during the pains. I could, at first, just feel the even smooth surface of the foetal cranium,

which seemed to be resting or lodged upon the top of the symphysis pubis, and not in the least degree *engaged*, or entered into the superior strait.

As the pains were regular and good, I expected soon to find the head engaged within the passage, but I observed that the uterus was very large, as if distended with an undue amount, or excess of liquor amnii.

At nine o'clock A. M., the pains, although regular and of increasing severity, had not caused the head to engage in the slightest degree : it remained exactly as at the first Touching. These circumstances led me to suspect that the womb was unprovided with a proper degree of energy, on account of its being distended beyond its just dimensions. I, on this hypothesis, deemed it advisable to rupture the ovum, in the expectation that, as soon as the womb should condense itself a little by the flowing off of the waters, it would acquire such vigour as to compel the head to engage in the strait, and thence pass speedily into the excavation, as I had repeatedly observed to be the case in other persons.

Upon rupturing the ovum, there came off a very great quantity of water ; I should think nearly two quarts in all ; but the head did not advance until three or four pains had acted upon it ; after which it came slowly down, and I felt a suture ; but as yet no fontanel was distinguishable. The examination induced me to suppose it was a vertex presentation of the first position, in which opinion I was most egregiously deceived by the very careless manner in which I made the investigation. At eleven o'clock I made a more careful inquiry, and was distressed to find that the left side of the os frontis was in the middle of the excavation, and that, by passing the finger very strongly up towards the left sacro-iliac junction, I could feel the left orbit and the nose, beyond which it was impossible for me to reach, in the then state of the organs of generation.

It seemed, on account of the advanced state of the labour, too late to turn, if that even could have been considered the best recourse ; and I was the more averse from such a proceeding, considering that I had, before, deli-

vered her of a large child, and also, that the waters were now drained off, and the uterine contractions powerful.

As she had by this time become heated, and very much disquieted with her pains, from which the suffering was severe, I gave her thirty drops of laudanum; and soon afterwards, took twelve ounces of blood from the arm. She also got an enema, of flaxseed tea and olive oil.

The head was now fairly engaged, and the face was becoming more and more the presenting part, notwithstanding my repeated endeavours to push it up, by forcibly pressing against the ossa malarum, during each pain; and I became thoroughly convinced that it was impossible to force up the face and bring down the vertex, by the employment of any legitimate force, or by mere dexterity.

The pains had become so dreadfully severe, and the poor lady suffered such agonies, that I really entertained serious apprehensions that the womb might rupture itself or the vagina, in its vain efforts to carry on the parturient processes, lashed as it was into a rage of excitement by the obstacles to delivery.

At my request, Dr James, the Professor of Midwifery in the University of Pennsylvania, was invited to see the patient, and arrived at two o'clock in the afternoon; and after having examined the case, left me, with encouragement to hope, that the vertex might come down, after some further efforts of the womb. Dr J. was to return to me at half past four o'clock.

In the mean time, I provided myself with the long right-hand blade of Davis's oblique forceps; and when the professor returned, at four o'clock, it was found to be vain any longer to expect the descent of the vertex. I therefore introduced the blade, above mentioned, behind the right ramus of the pubis—got it upon the right parietal bone—and, using it as a vectis, drew down with it during the pains. The head advanced very much by this aid, and began to press upon the perineum; but there it stopped, and seemed no longer affected by the vectis.

I next attempted, with my French forceps, to introduce

the male blade behind the left obturator foramen. I was foiled, but Dr James succeeded in adjusting it. Every attempt to adjust the female blade, whether made by Dr James or by me, proved fruitless. They could not be made to lock; nevertheless, I attempted to deliver with them by securing the joint with one hand, and by this means the head again advanced, but soon stopped. The forceps were now abandoned, after vainly attempting to make them lock. I now resorted to the oblique vectis again, and with it caused the head to advance so much as to put the perineum in a state of tension. The face turned to the pubic arch; the chin emerged from the genital fissure; and as the successive portions of the face came forth, the chin rose up to the mons veneris, and allowed the fourchette to slip backwards off the vertex, which immediately retired towards the coccyx.

The child was born, but the cord, which was round the child's neck, did not pulsate; the infant, however, began to gasp, and, after having been well dashed with brandy, cried lustily. It was born at half past six o'clock P. M., so that the labour was found to have continued about fourteen or fifteen hours.

At the time I last put on the vectis, the child's face was in the left sacro-iliac corner of the pelvis. Both Dr James and I expected that the rotation would inevitably carry it to the sacrum, and the chin be consequently delivered at the perineum. I have every reason, therefore, to believe that the vectis was the chief means of giving the head so favourable a rotation, a result attributable to the admirable curve of Dr Davis's oblique blade.

The perineum was not hurt; the placenta came off in twenty minutes; and the mother found herself very comfortable, considering her great fatigue.

The face was one enormous suggillation, carried to the extent of producing numerous blebs, or vesications on the eyelids and cheeks. The mouth was extremely swelled, and the left eye completely closed. The face was, on account of this state, directed to be frequently bathed with cream. This infant was carefully weighed on the evening of its birth, and was found to weigh nine pounds and three quarters. On the sixteenth day after

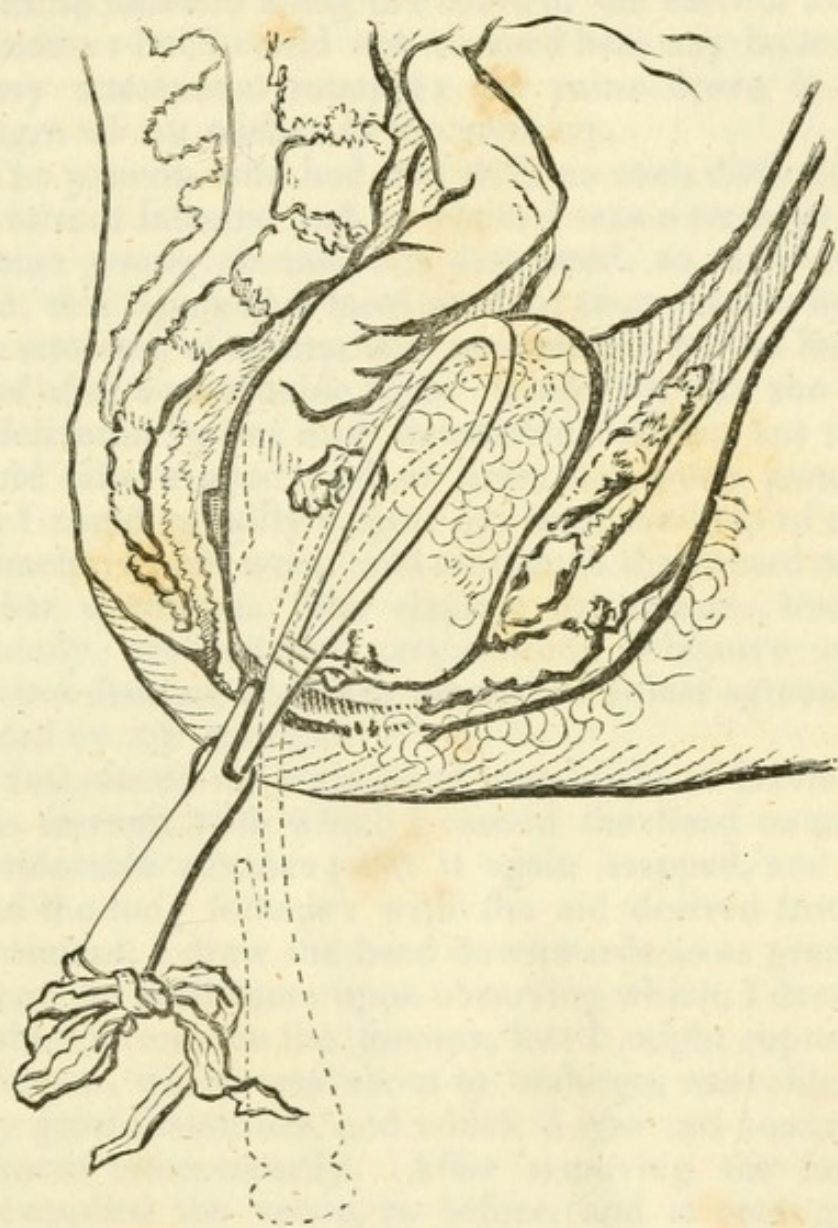
delivery the lady was down stairs to dinner, and had no subsequent indisposition.

In giving the details of this case, I am liable, as I well know, to the charge of having, in an important matter, anticipated my subject. But although I have not yet come to the formal consideration of forceps cases, I feel pretty well assured no evil will happen to any student for having, by reading the foregoing relation, in some degree anticipated the regular and formal consideration of forceps operations.

The *Cut*, which represents the foetal head, in a face labour, thrown back to that degree as to press the occiput against the interscapular space, suffices to show how well founded were my fears lest the forehead, instead of the chin, should rotate to the front, to prevent which is the chief doctrine of this obstetric topic; and I would again urge the student to take the first opportunity that may present itself, of testing the doctrine, by trying to deliver on the machine, or *phantome*, with the chin backwards, in a face presentation. By so doing, he will, at once, have a demonstration of the point of practice to be adopted, and never afterwards be in the least danger of making a mistake, or committing a blunder in this matter.

A case of a different kind occurred to me on Wednesday, the 17th of February 1830. Mrs M. was in labour with her seventh child, having been taken at four o'clock A. M. with the pains, which continued to increase up to the time when I arrived, which was about half past six o'clock. The pains were strong; the waters gone off; and the head pretty low down in the pelvis. At my first examination, I mistook the position, thinking that it was a vertex case; but as the pains seemed to have no good effect, I examined again, and could feel the root of the nose *directly* behind the symphysis pubis, and the superciliary edge of the orbit upon each side of the symphysis of the bone.

Upon this discovery, I endeavoured to turn the forehead towards the left, by raising the os frontis and pushing it in the proper direction; but as soon as each pain came on, it forced the presenting part back again into its



former position. I next endeavoured, by simply pushing up the forehead during the absence of a pain and sustaining it while the pain was active, to cause the vertex to descend along the curve of the sacrum and the perineum: but I could not succeed here any better than in my attempts at rotation; the pains drove it back, *maugre* all my wishes to the contrary.

The patient, who had met with no such difficulties in her former labours, and to whom I was a stranger, now became greatly alarmed and distressed, so much so, indeed, that I judged it most prudent to explain to her the true situation of affairs, and encouraged her to look for relief after a reasonable time. I told her that she could be delivered by her own unassisted efforts; but that it would take a good deal of time, and much pain: but that I could speedily deliver her with the help of an instrument, which would add neither to the hazard or pain of her condition. She clapped her hands; trembled violently, and uttered exclamations indicative of the greatest dismay, and even terror, but at last agreed to be guided by my opinion.

I introduced the right-hand long blade of Davis's oblique forceps, with which I caused the head to make a considerable advance; but it again stopped, and I applied the long forceps: with the aid derived from this instrument, I drew the head downwards so as greatly to extend the perineum; upon observing which, I deemed it prudent to remove the forceps, lest I might rupture the perineum, which was about to undergo, unavoidably, a very great distension, and which I was not inclined to augment unnecessarily. After removing the forceps, I re-applied the vectis, as before, and it very greatly assisted me to bring the head onwards as far as was requisite. As soon as I withdrew the vectis, a pain came on, by which the head was expelled, the vertex passing out over the *fourchette*, upon which it immediately completed its act of extension, and allowed the crown, forehead, nose, and chin, successively to escape under the pubic arch. The child was born alive, and the afterbirth followed in ten minutes. Upon the infant's forehead was an enormous black *suggillation*, which disappeared in the

course of a few days, and was followed by no inconvenience.

Of the above case, it is proper to remark, that, the mother was very well formed, and the pelvis large; the child of medium size; and although it did not become actually a face presentation, but was, the rather, a case of presentation of the forehead, it still serves to illustrate my observations on the difficulty of converting face presentations into those of the vertex. I think that but for the aid of the instruments, it must have at last brought the face from behind the top of the symphysis pubis to look fully down into the excavation; for the difficulty of restoring the vertex, although not insuperable, was exceedingly great. In the course of my practice, I have met with a considerable number of cases like the one whose relation I have just given, but it seems unnecessary to cite them here, as I presume this one may suffice to explain the nature of the mechanism of such a labour.

I find, in my case book, another example of face presentation, which I shall not deny myself the privilege of laying before my reader in this place, because it offers good encouragement to those who may happen to meet with such untoward sorts of labour in the commencement of their practice.

October 11th 1830. Mrs C. W., aged twenty-six, in labour with her first child. I was called at twelve o'clock last night. She had been poorly throughout the day, but kept about until bedtime. At ten P. M., had a violent pain and large discharge of waters. She lay on her left side. Upon touching, I could not reach the os uteri, nor feel any part of the child. Upon causing her to turn on the back, I was enabled, by pushing the finger very far upwards and backwards, to hook the anterior lip of the os uteri, and draw it, by means of the finger, downwards and forwards, into the centre of the plane of the upper strait: I then could touch the child's cranium, but could not touch a sufficient portion of it to learn what part of the cranium it was. Not long afterwards, I felt, in the left anterior part of the upper strait, a ridge or edge, which I soon made out to be the superciliary edge of the

orbit of the left eye, the globe of which soon came into my reach. I could not touch the anterior fontanel.

Here then was a case which was to be a face presentation at last, if I should prove unable to prevent it by failing to restore to the head its lost flexion. I vainly tried to do this by pushing up the forehead, and holding it up during a pain. It always came back to its place in spite of whatever efforts I could make. I next introduced the whole hand except the thumb, took hold of the vertex by a fair purchase, but could not turn it downwards, and at length becoming convinced of the impossibility of succeeding, I resolved to abandon such irritating efforts.

As the head sunk lower and lower, there was an obvious tendency of the face towards the left sacro-iliac junction. I opposed this movement of the head by pressing the finger on the right side of the nose, which kept it from turning to the left, and at last brought it to the obturator foramen. The face came more and more down into the excavation, and began to swell very much. The lips became excessively tumid and excited, and the whole face at last felt like a tense bladder. By the force of the pains, alone, the chin was afterwards slowly brought to the os externum, and applied itself to the top of the pubic arch, under which little by little it emerged, and then rose up towards the mons, permitting the front of the throat to take its place under the arch, and thus allowing the vertex to escape last from before the fourchette.

The placenta came off in six minutes. The infant was very weak, and its face greatly swollen, and black with the suggillation. It soon cried loudly, and I find that on the 14th, i. e. three days after its birth, it was in fine health, and without any swelling of the face. The mother had a very favourable getting up. The net weight of the infant was nine and a half pounds. The mother was a large and very powerful woman.

Madame Boivin informs us in her *Memoires sur l'Art des Accouchemens*, page 276, that out of seventy-four cases of face presentations, fifty-eight children were born naturally. Of these, forty-one were delivered without any assistance, and seventeen, by restoring the vertex to

the centre of the excavation. Fourteen cases required the turning and delivery by the feet, while only two were extracted by the forceps, and in one of the latter cases, the mother had convulsions.

"Thus," says the learned lady, "although presenting by the face, the child may be born alive and naturally, provided the head be not too large; if the parts of the mother are well formed; the pains strong and good; the woman resolute and healthy; and no accident occur during the course of the labour."

Madame Lachapelle, whose vast experience, gained while at the head of the Maternité Hospital at Paris, gave her undoubted claims to speak as from authority, and whose thorough knowledge of the theory of midwifery must confirm those claims as rights, gives us only two sorts of face presentations: one in which the forehead is to the left, and the chin to the right of the pelvis, and the other in which the forehead is to the right and the chin to the left. She says she never met with Baudelocque's first and second positions; and Dr Dewees, who asserts that his list comprises near nine thousand labours, also informs us that he never met with them. It will be remembered by the reader that the second case which I related in this chapter, that of Mrs M., was one in which I felt the root of the nose behind and above the symphysis, and the two orbits on each side of it; and they will admit that although the vertex was at last restored so as to escape first, yet this was a real example of a face case of the rarest occurrence. Smellie gives us at least four examples of the face presenting in Baudelocque's first or second positions; and assuredly no English or American student of midwifery will be disposed to call in question the accuracy or candour of that admirable author, notwithstanding that Madame Lachapelle tells us she finds no very evident examples of such face positions in any good collection of cases.

For my own part, I do not perceive the great importance of dwelling with much emphasis upon all the possible positions of the face. It cannot be doubted that they are each possible. The more important and use-

ful knowledge is that which teaches us the nature of the accident, and the appropriate indications of treatment. But we have already seen that the accident consists in an excessive departure of the chin from the breast, or failure of flexion; that is the first principle: and the principal indication founded upon it, is, to restore the flexion by pushing up the forehead and bringing down the vertex; and where that cannot be done, the next indication is to rotate the chin to the front, so that flexion may take place as soon as possible after the chin has emerged.

As I shall have occasion to revert to the consideration of face positions when I come to treat of the various uses of the forceps, I shall close the present chapter, in order to open a new one, on the positions of the head.

CHAPTER XIII.

ON THE POSITIONS OF THE HEAD, AND THEIR MECHANISM, IN LABOUR.

IF there be a true republic of letters, then there ought to be an equality of rights and privileges for each individual composing that republic. There ought to be no tyranny ; no exactions upon faith or practice, except by laws regularly enacted by the representatives of all the persons concerned in their operation. But it happens in the republic of letters, as in every civil polity, that there be demagogues, who set their faces, as a flint, to lead or seduce the people, into such ways, and such only, as may be laid out for them ; or else, seizing upon supreme authority by a real usurpation, they endeavour to extort an obedience and conformity, by force of their mere supremacy, and not by addressing the sober and calm convictions of the people. The disciples of Pythagoras were accustomed to reason altogether by the law of their master's will ; and it was sufficient evidence for them, when they could say *ipse dixit*, or *magister sensit* : and so great was the power of Galen over men's minds, that he ruled in medicine as with an iron crown, for fifteen centuries ; and so completely had he control over his asseclæ, that one of them, Avicenna, declared, *Se malle cum Galeno errare, quam cum omnibus aliis bene sentire.*

It cannot be denied that great men ought to, and do exert a powerful sway over the opinions of their ad-

mirers and followers; but they should always be held as a sort of suspected persons, and their decisions and dogmas received with that degree of respect to which their authors are entitled, and not as laws never to be abrogated or called in question: for it is a right, common to the humblest as well as the most elevated member of the profession, to seek for the elements of his opinions or judgments, not in written opinions, or in the dicta of those who are supposed to be masters in our art, but rather in patient investigation of the facts which come under his own observation. Those who are subservient to authorities never reason so well, or act so well as those who make up an independent judgment based on severe study, not of words but of things, not of theories but of nature herself.

The ancients seem to have made very little progress in the cultivation of midwifery as a science; and although there were skilful surgeon-accoucheurs in Europe more than two hundred years ago, such as Mauriceau, for example, still, the true nature of the processes by which children are ushered into the world, at the full term of pregnancy, was imperfectly understood. Great improvements have been made in very modern times: and it is not quite one hundred years since we first began to learn that the head generally enters the pelvis in an oblique direction, and leaves it in an antero-posterior one; the first clear account of the matter having been given by Sir Fielding Ould, of Dublin, about the period above mentioned. Certainly, that great man, Mauriceau, who was in his greatest activity and fame at the beginning of the seventeenth century, never gave any account of the rotations of the head, or the real mechanism of labour, although it is not to be supposed that he could be ignorant of a fact of such common occurrence, in his great practice; but a majority of mankind are capable of knowing and appreciating a truth, without, perhaps, the smallest disposition to make a great noise about it. Mauriceau, for instance, must often have felt the os occipitis directed towards the acetabulum, and found it to rotate towards the arch, as a regular occurrence in labour; yet he did not say so. The knowledge of this

rotation is, however, of the greatest consequence; and, for the purpose of rendering the proper assistance to persons in labour, the medical attendant should always be capable of ascertaining the diagnosis of the position for the time being. Of this he can learn nothing without touching the head of the infant before its birth, which operation of touching the child is called the examination *per vaginam*.

If the patient's assent can be obtained, after the proper reasons for asking the privilege of making an examination have been laid before her, we should have two principal objects in view, while performing that operation: one of these is, to note the presentation, and the other, the position. There are other observations to be made at the same opportunity, such as the degree of softness or relaxation of the parts—their moisture or dryness—the state of the rectum—the sensibility, &c., &c.

Upon obtaining the patient's consent to the examination, she should be requested to lie on the bed upon her left side, with her hips near the foot of the bed, and the knees drawn upwards towards the abdomen, a small pillow having been previously placed betwixt the knees. Except upon occasions of the greatest emergency, a third person should always be present, and the physician ought to refuse to perform the operation of touching, except in the presence of a third person, who ought to be some elderly individual, acting as the nurse for the occasion.

Let the attendant provide a napkin, and a small quantity of pomatum, lard, or other unctuous substance, and a basin of water for the hands. When a smart pain comes on, the left hand of the practitioner being pressed against the sacrum of the patient, outside of the bed-clothes, the forefinger of the right hand, properly anointed with the lard, should be introduced into the vagina, taking care not to bruise or irritate the patient by any rough or hasty proceedings. If the point of the finger be now carried towards the upper extremity of the vagina, the *os uteri* is felt, and its degree of dilatation ascertained. When the finger comes to the *os*

uteri, if the pain still continues, let the greatest care be taken not to rupture the chorion, or the bag of waters, as it is called, especially in a first labour. These membranes are extremely tense during the pain, which forces them down through the opening of the womb, forming the segment of a sphere, of greater or less size, according to the greater or less degree of the dilatation: if they should be too roughly touched while in a state of tension, they might burst, and permit the liquor amnii to escape; an unfavourable event in the early stage of labour, which it both retards and renders more painful. There is no need for pressing against the bag of waters during the pain, because, by waiting until the pain subsides, the bag becomes relaxed, and can then be pushed back again within the mouth of the womb, so as to enable the finger to touch the head. For the most part, we only ascertain, in such an examination, the presentation, and being satisfied with that, we wait until a great dilatation, or the discharge of the waters, allows us to discover the position. During the operation of *touching*, we endeavour to learn the condition of the orifice of the womb, as to whether it is rigid, unyielding, or soft and dilatable; whether it be thick and dry, or thin and moist with an abundant discharge of glairy phlegm. We also ascertain if the os uteri is in a favourable position, i. e., in the middle of the pelvis, where it ought to be; or on one side; or high up behind, towards the sacrum: and we rectify its position, if need be, by changing the situation of the mother to her back, or to either side, accordingly as we may judge most fitting to bring the mouth of the womb into its proper place. Thus, suppose the mouth of the womb inclined altogether to the right side of the pelvis, the patient being on her left side; let her turn on to her back, or quite over to her right side, and the axis of the womb will be brought more nearly to the middle line or axis of the pelvic canal.

We are, also, in this operation, to form an opinion as to the probable resistance to be made by the vagina, perineum and labia, so as to make up our prognosis, which it is best, however, to keep as a secret, not to be

divulged for the present. At length, the pains having opened the os uteri to the greatest extent, and driven down the bag or bladder of waters almost to the orifice, the membranes burst, and the fluid of the ovum escapes with a gush. As soon as practicable after the escape of the liquor amnii, the touching should be repeated, and now there is little difficulty in determining the position of the head.

In general, that side of the pelvis in which the head can be felt at the lowest level, is the one to which the vertex points—for the head already dips, in order to enter the bony canal. But if, upon feeling the scalp with a finger firmly pressed upon it, a suture is discovered, which, upon being traced, is found to meet with two other sutures, and no more; that point of union will be the posterior fontanel or vertex; and it will be in the first position if it be near the left acetabulum, in the second position if it be found near the right acetabulum, and in the third position if it be directly behind the symphysis of the pubis. But if, instead of three sutures, there be four, with a large membranous or soft space betwixt their points of union, it will be the anterior fontanel; and if it be near the left acetabulum, the head will be in the fourth position, in the fifth if it be to the right acetabulum, and in the sixth if it be near the pubis.

I have known many young students to be exceedingly embarrassed by being compelled to learn by heart a great many divisions and distinctions which are purely artificial. Such a student would naturally suppose that, if there be but six positions of the vertex, each solemnly numbered from one to six, no labour could take place with the vertex in any other attitude. But he should understand, that, if his professor or teacher chooses to make twenty varieties of the vertex positions, or another man pleases to reduce them to only four varieties, each one of those cardinal attitudes is capable of being greatly varied so as to cause it to approach near to the one next in order, or to be more remote from it. In fact, the head may descend so that its point may be directed to any part of the pelvic circle; and, if men have chosen to say that there are only six positions, it is not because there

are no more than six cardinal points of the pelvis, but because they thought that all the other possible attitudes could be referred to some one of the legitimate six. Thus, I may have a case which I should call the fifth position of the vertex, and yet the vertex may incline back so much as to be almost worthy of being called a sixth, or it may be turned forward so far as to be almost a first position. In truth, we shall generally be able to discover, if we examine early in labour, that the position of the head is by no means a fixed one, because, if the child is alive, it is always endeavouring to move the head, turning it to the right or the left, and thus causing the vertex to sweep round a fourth, or even a half of the circle of the superior strait; and this frequent rotation of the child's head continues until it is driven down so far as to be restrained from spontaneous motions, either by the narrowness of the bony passages, or by the contractions and resistance of the soft tissues. In all cases, the head should be considered as movable at the will of the living child, until it is engaged in the strait, by which engagement is understood, its having fairly entered into the bony pelvis. In whatever labours the head of the fœtus is very small, as compared with the size of the pelvis, the power of boring with the head, or rotating it, continues even to a very late stage of the process of parturition. I have very frequently had occasion to note the boring or rotary motion of the child's head, after it has fully passed the superior strait, and occupied the excavation. I should be quite incapable of asserting, in such instances, that the position is or is not the first, the fifth, the third, &c., &c., for it might be each by turns, and neither of them long. There is no difficulty of referring the case to one of the cardinal positions, in all those labours wherein the child's head is large, or the pelvis small, for in such labours it is fixed.

I ought to observe here that the student should make a careful distinction betwixt the words presentation and position. The former refers only to the part that presents itself to the passages, and the latter to the direction which the presentation assumes. There is a presentation of the feet, the shoulder, the breech, the vertex, the face,

the hand, &c., but each of these presenting parts may take various positions. For example, the vertex, when it is the presenting part, is most commonly found towards the left groin, or rather, it is opposite the left acetabulum. To show the comparative frequency of this position, I have it to say, that, in supervising twenty thousand five hundred and seventeen labours, Madame Boivin, who is at the head of the Maternité Lying-in Hospital, at Paris, found fifteen thousand six hundred and ninety-three cases in which the vertex presented in the above mentioned position; whereas, she found that in only three thousand six hundred and eighty-two of the cases, did the vertex present towards the right groin.

Those who have written or taught upon the subject of the positions of the vertex in labour, have concurred in calling that the first position in which the vertex is towards the left acetabulum. It is first, because it is most frequently met with. The second position is that in which the vertex is turned towards the right acetabulum, and the third is that in which the point of the head is behind the symphysis of the pubis. These three are well defined as occipito-anterior positions. In the remaining three positions, the forehead is towards the front, and the vertex towards the posterior part of the pelvis, the attitude of the head being the reverse of the first three; and, therefore, they are occipito-posterior positions. The enumeration proceeds from the third to the fourth position, in which the vertex is pointed towards the right sacro-iliac junction; the fifth, where it is towards the left junction of the ilium and sacrum; and lastly, and, I may add, most rarely, the sixth position, where the vertex is towards the promontory, and the forehead behind the symphysis.

M. Flamant, and many others, contend that we ought to acknowledge two other original vertex positions, viz., one in which the posterior fontanel is to the left ischium, the head being transversely disposed in the pelvis, and the other in which it is turned towards the right ischium. I should not be at all indisposed to adopt eight instead of only six cardinal positions, especially as I find that a

great many cases do present the vertex in one of these latter ways.

Upon reflecting on the greater frequency of the occipito-anterior positions, it appears to me not to be difficult to explain the reason why the head in labour is so commonly presented in that manner, rather than in the contrary way.

The child, in utero, naturally lies on its back, with the head inclined downwards towards the orifice of the womb. The longitudinal axis of the womb, at the close of pregnancy, and especially at the commencement of labour, dips at an angle of about forty-five degrees towards the horizon, in a woman who is standing or sitting up. The child, which is in a complete state of flexion, both as to its body and its limbs, would naturally roll in the waters in such a manner as to permit its back to fall lowest, and fill up the concavity of the anterior paries of the uterus, while that organ is itself resting on the abdominal muscles, which it protrudes before it, and which form a soft and elastic cushion for it.

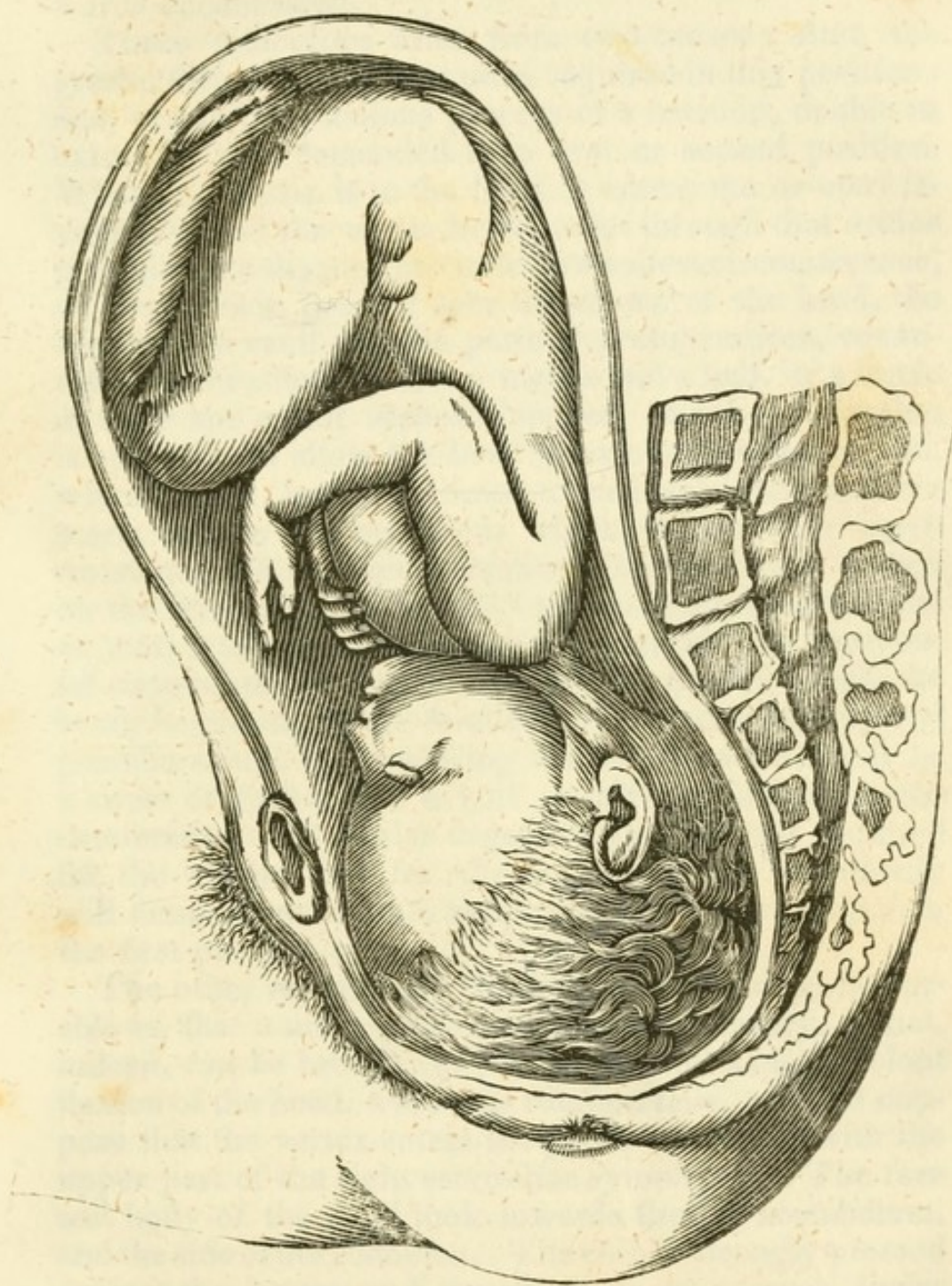
The disposition which the parturient woman has, during the early pains, to stoop or lean forwards, could not fail to bring the child nearer to a horizontal position, and thus still more greatly favour its tendency to roll upon its back; so that, when the head comes, at last, to engage in the circle of the superior strait, its point will be turned somewhat towards the pubis, or front of the pelvis, i. e. it will assume an occipito-anterior position. If this view be admitted as correct, then it will be highly proper to permit the woman to sit up as much as she pleases in the early stages of the labour, or until the head is engaged so far as to make it improbable that it can continue to roll freely in the waters. Further, as it is generally better that the head should be presented in the first position, the patient ought to be advised to lie, when she is on the bed, upon the left side, in order that the child's back, by falling into the lowest concavity of the womb, may cause the occiput to direct itself towards the left side of the pelvis.

In a good many cases, however, the forehead occupies the place that ought to belong to the occiput, and

there are many reasons why such a reversal of the posture should occur: among others might be mentioned the habit of lying upon the back; a degree of restlessness, which, by causing the woman to change her position frequently, might prevent the fœtus from settling down in the proper direction; or the spontaneous movements of the child, which are sometimes very strong, and which, by rotating the head, might very readily occasion it, at last, to present in an occipito-posterior position. If, when this position is discovered, the woman is not lying upon her side, she should be advised to do so, as the proneness of the head to revolve, cannot be expected to produce a favourable change, unless the attitude of the patient should be so judiciously prescribed as to promote or facilitate that change.

Any attempt, except one made by means of regulating the posture of the patient, must fail to effect a change in the position of the head, in the early stages of a labour: we cannot act upon the head until the waters are gone off; nor is it allowable to break through the ovum, under these circumstances, until a great dilatation of the os uteri is effected; for the desirable rotation cannot be brought to pass near so well in a completely contracted womb, as in one where an abundance of waters permits the body of the child to turn freely on its axis, and conformably to the mutation of the head's position. Hence, it generally happens, that in cases of occipito-posterior position the labour proceeds without rotation until the os uteri is fully dilated, and the head descends so low as to begin to press upon the floor of the pelvis. But in order to get thus far, more time and pain are required than in occipito-anterior positions, *cæteris paribus*.

The vertex, when it is directed towards the back part of the pelvis, enters very readily into the superior strait, and descends under and behind the brim, towards the wing of the sacrum. Indeed, in some instances of labour, the head engages in this way even more rapidly and easily than in the occipito-anterior positions, and the attendant, seeing the rapid progress of the head, is very liable to make a false prognosis, by promising



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an early delivery, in which he is egregiously disappointed in consequence of the difficulties to be afterwards encountered.

These difficulties arise from two causes : first, the greater dilatation of the os uteri required in this position ; and, second, the tedious process of a rotation, double in extent to that demanded in a first or second position. When the vertex is to the front, it enters the os uteri favourably, and the whole head passes through that orifice presenting to the uterine circle its smallest circumference, or that which, passing over the crown of the head, the base of the scull and the parietal protuberances, constitutes a circumference of ten inches and a half, or a circle of three and a half inches diameter. Such a dilatation is sufficient to allow the head to escape into the vagina, which, again, must be dilated to an equal extent and not more, and so of the vulva, which attains with much resistance the required dilatation ; but when the vertex, on the other hand, descends in a posterior direction, the os uteri must open sufficiently to embrace the horizontal circumference of the head, which passes round the head, beginning at the forehead, embracing the parietal protuberances, and enclosing the vertex, which will be a circle of twelve and a half or thirteen inches in circumference. A similar degree of distension is required for the vagina and for the vulva ; which manifestly will demand more time, and cause much more pain than the first position case.

The other reason why these labours are not so favourable is, that a much greater rotation is necessary, if that, indeed, can be brought to pass at all, and a most violent flexion of the head, where the rotation fails. Let us suppose that the vertex enters the pelvis in contact with the upper part of the right sacro-iliac symphysis. The face and body of the child look towards the left acetabulum, and the side of the abdomen. The chin is strongly pressed against the breast, and the vertex is at a much lower point than the top of the forehead, or, in other words, the occipito-frontal diameter of the head dips from before backwards, from above downwards, and from left to right. It is the occipital extremity of this diameter that

soon meets with an obstacle to its progress, for it comes to abut directly upon the curved surface of the bone, towards the lower and back part of the pelvis, or upon the elastic inclined plane composed of the sacro-sciatic ligaments. While it is driven against these obstacles with greater or less impetuosity, the frontal extremity of the diameter seems to repose or lean against the opposite and superior portion of the pelvis. It sometimes happens that the vertex is propelled against this obstacle for hours in vain, producing a total arrest of the head, and even, at last, jamming the forehead down on the opposite side of the pelvis, until it becomes immovably fixed or impacted there. But, fortunately, such is the admirable construction of these surfaces, that it most frequently happens that the vertex slides off towards the lower part of the ischium, until the head is fixed transversely in the pelvis, and, at last repelled by the inclined plane of the ischium, continues to slide forwards and downwards until it comes under the pubal arch, from under the crown of which it emerges, rising towards the pubis, as it escapes, and allowing the head to extend itself so as completely to remove the flexion, which, as it was the first foetal movement in labour, so the recovery from it is the last.

This is the most common and most favourable occurrence in the occipito-posterior positions. Where that fails to happen, the vertex slides backwards into the hollow of the sacrum, and the head is placed in an antero-posterior direction. Under these circumstances, the occipito-frontal diameter is so long, that either the vertex or the forehead must soon get lowest. In a common sized child, the forehead cannot get down, therefore the vertex moves slowly and painfully down the middle of the sacrum, over the coccyx and the perineum, pushing the latter out most enormously, and elongating the labia majora until they acquire dimensions sufficient, or break off. The vertex at last reaches the edge of the perineum, and escapes over it, whereupon the head begins to extend itself backwards towards the sacrum; lastly, the forehead, eyes, nose, mouth and chin enter in succession under the arch, and the child's head is completely born.

It is difficult to imagine how a child can escape death in such a labour; nevertheless we find that some are born so without any very alarming delay or difficulty.

The pure specimens of third and sixth positions are supposed to be very rarely met with. The intrusion of the promontory and the lumbar vertebræ, are the causes why the head enters obliquely; but I think Madame Boivin and Madame Lachapelle would have seen more specimens than they have recorded, had they been diligent in their searches for it at an early stage, in the sixty thousand labours they have superintended.

It is quite true that the convex surface, either of the vertex or of the forehead, would easily slide off from the convex projection of the sacrum: yet I am sure that the circular or horizontal contraction of the cervix uteri does sometimes grasp the head so firmly as to hold it fast in any position in which it might happen to be secured; and I have attended one person, in two of her labours, in both of which the vertex was, at an early stage, in the hollow of the sacrum, and the great fontanel behind the pubis, the child being delivered with the vertex at the fourchette. I inferred that the presentation was an original sixth position.

If the vertex presents in the first position, and, after the proper rotation, comes to emerge under the arch of the pubis, the right shoulder of the child will enter the pelvis near the right acetabulum, and the left one in the left sacro-iliac region, the shoulders assuming a diagonal position, the reverse of that taken by the head. As soon as the head escapes from the external organs, the shoulders, descending into the excavation, are compelled to undergo a rotation, by which the right shoulder tends forwards towards the arch of the pubis, and the left one falls backwards to the hollow of the sacrum. In a majority of instances, the shoulder that is nearest the sacrum descends more rapidly than the other, and escapes first, soon after which the right shoulder emerges, and the body is afterwards speedily expelled.

CHAPTER XIV.

ON PRESENTATIONS OF THE PELVIC EXTREMITY OF THE FŒTUS.

As the length of the gravid uterus, at full term, does not exceed twelve inches, and as a well grown fœtus is nineteen or twenty inches in length, it is evident that it must, while in utero, be folded up in a very compact form, and that it will be an oval body, one of the extremities of which ought to be directed towards the orifice of the womb, and the other to the fundus. The natural position of the fœtus is certainly that in which the head points downwards; so that the vertex, or some part of the head ought to advance first. But it happens that about one in every forty-five or fifty cases presents the other extreme of the oval to the os uteri; and in doing so, it is a matter of mere chance whether the breech, or the knees, or the feet, prove to be the presenting part. In strictness, the breech ought to descend first in these labours, but if the feet happen to be near when the membranes give way, they are quite likely to fall into the opening, and pass, soon afterwards, out at the vulva; so that, supposing the breech presentation to be, after those of the vertex, the most natural, we may properly include in the account of the presentations of the pelvic extremity, those of the knees and feet, and regard them as mere accidents of the pelvic presentations, and all to be included under the head of natural labours.

It is not an easy matter to determine why the breech presentation occurs about once in forty-five or fifty

labours, and it is far less easy to say what is the reason that certain women are prone to this sort of labour to such a degree as to bring all their children so. I knew a lady whose children, three in number, were all born with the breech presentation, and it is by no means very rare to meet with persons who have been similarly situated in more than one of their labours. Dr Collins, of Dublin, in his recent valuable work on Practical Midwifery, informs us, that one woman who was delivered at the Dublin Lying-in Hospital had preternatural presentations in every one of her labours, and she had given birth to nine children. While that gentleman was master of Dublin hospital, sixteen thousand four hundred and fourteen women were delivered, of whom three hundred and sixty-nine had presentations of the breech, feet or knees; making rather more than one such labour, in every forty-five cases.

The causes which produce these presentations must be purely accidental. The natural presentation is that of the head, which is turned towards the os uteri from the earliest period of pregnancy. The attachment of the navel string is nearer to the pelvis than to the head of the child, the head therefore hangs downwards; but when the cord, by the growth of the ovum, has become of a very considerable length, the child ceases to be dependent from it, for the cord is not unfrequently from twenty to thirty inches long. It seems very probable that while the fœtus is yet small, it may change its position in the uterus; but if it happen to turn as late as the fifth month, it will be apt to retain the attitude it may then acquire, till the end of the pregnancy, as its length does not admit of its changing again very readily after that period. It is not to be doubted, however, that the attitude may be reversed, by certain extraordinary or violent movements of the mother, at a later period, so that the head, which was originally at the os uteri, may be brought to the fundus, and vice versa.

Notwithstanding that the breech presentation is met with only once in forty-five or fifty labours, I am not inclined to regard it as a preternatural case, for I cannot discover any reasons for classifying it with that sort of

births, in the mere fact that the head does not present. The breech composes one of the ends of the foetal oval; and a breech labour requires, for its complete success, no greater dilatation than that demanded for the passage of the head. It may be effected without any aid, and is, perhaps, not really fraught with greater danger for the mother than the other, or more common vertex presentation. It is, however, far more dangerous for the child than the vertex case; and as the object of parturition is the safe birth of the infant, it might be absolutely proper to include, in the class of preternatural labours, all those in which the child is exposed to unusual hazard.

The danger to the child, here, depends on its liability to asphyxia, from several causes: first, the compression of the cord, which is pressed betwixt the child and the parts from which it is escaping; second, detachment of the placenta before the head is born, by which the uterine life of the child is destroyed before its birth; and lastly, the compression of the placenta itself betwixt the uterine parietes and the head of the infant, or the constriction of the placental superficies of the womb during the time that the child's head, still remaining in the vagina, and lingering there, ceases to distend the uterus, which then closely contracts on the afterbirth, and even if still retaining its connexion with it, yet suspends all the utero-placental operations on which the foetus depends for existence, antecedently to the establishment of respiration. The breech may descend into the excavation, and it may even pass through the vulva, without the least danger of compressing the cord; but when the body of the child has sunk so low as to bring its navel down into the bony pelvis, there is danger that the arteries of the cord may be completely obstructed for a period long enough to give the child a fatal asphyxia, an event far more likely to occur where the feet present than where the breech advances; because, in the latter case, the thighs, and sometimes the legs, are extended along the front of the body in such a manner as to protect the cord from pressure, that part being fully guarded, by its position betwixt the thighs, during all the time the body is escaping, and thus enabling the infant better to bear

the temporary pressure on the cord, for the short time it is compressed only by the head, while that part is in the excavation ; a pressure, that would extinguish a life that was already about to expire from a long continued preceding pressure by the child's body. In general, the danger for the child is not great until the head has sunk down into the excavation, because it commonly does not take a great deal of time for the whole of the body to pass through the canal of the pelvis ; but the head, being subject to arrest while in the passage, may then fatally compress the cord betwixt itself and the bony sides of the pelvis.

I think it probable that more than one child in every five that presents by the breech, or feet, or knees, perishes in the birth. In large lying-in hospitals, perhaps, the proportion of fatal cases is rather more favourable, in consequence of the prompt attention always paid in such establishments to the parturient female, and to the greater skill and dexterity acquired by abundant opportunities of practice.

It is a question whether the nature of the presentation can be discovered by reference only to the movements of the fœtus in the latter stages of gestation. Some persons have foretold that the child was improperly placed, judging it so to be by feeling a greater degree of motion in the pelvic region than in the upper part of the uterus. It seems not difficult to believe that if the motions of the child should be chiefly felt towards the cervix uteri, they ought to be accounted for by referring them to the presence of the feet in that quarter. However, I feel assured that those patients whom I have attended, and whose labours were accompanied with this presentation, were utterly unsuspicious of it in pregnancy ; and are, generally, ignorant of it until the child is born. It is not uncommon, indeed, for women to fear that the child is to be born double, as it is called, when the vertex really does present ; and some patients are quite convinced the child is wrongly placed until labour comes on to prove their fears ill founded. There may be some certainty, perhaps, of a diagnosis derived from the stethoscope applied to different parts of the uterine region, for

if the child's head be directed towards the fundus uteri, there will be, in consequence, a pulsation of its heart at a higher level than if the head occupy its more natural position—probably near the navel ; but there will always remain some liability to wrong impressions, if they be derived from auscultation alone. The surest way is that of the touch, which is scarcely to be confided in except at the commencement of labour, or at a period when the presentation can be touched with the tip of the finger.

When the breech can be reached per vaginam, it ought to be recognised by its mass, filling up the pelvis ; by its softness, and its fleshy feel, so different from that of the foetal head ; by the tubera ischii ; by the point of the coccyx, the anus, and the organs of generation, male or female ; by the spines of the sacrum, and by the sulcus found between the nates and the thighs, which tend upwards from the presenting part—I may add, also, by the meconium which is often discharged at a pretty early stage of labour, and comes away with the waters, on the hand of the accoucheur ; but let not the young accoucheur be deceived by this symptom, since it is possible for portions of the meconium to come away even in the best vertex position. It is also to be observed, that the form of the bag of waters is commonly not so much like a segment of a sphere in the presentations of other parts than the head. In breech presentations, it is more like an intestine in shape, sometimes descending to the very orifice of the vagina, and yet not very considerably dilating that passage.

Notwithstanding we ought to be able clearly to distinguish betwixt the breech and the head presentations by the first touch, it is, I think, not very uncommon for us to make a very great mistake, if I may judge from the instances of mistakes that have come under my knowledge ; but I am very sure that such errors are the results of mere carelessness, and they should therefore be always avoided. Let it not be here understood that when the true nature of the presentation is known it ought to be communicated to the patient ; on the contrary, it should be carefully concealed from her, as not calculated to pro-

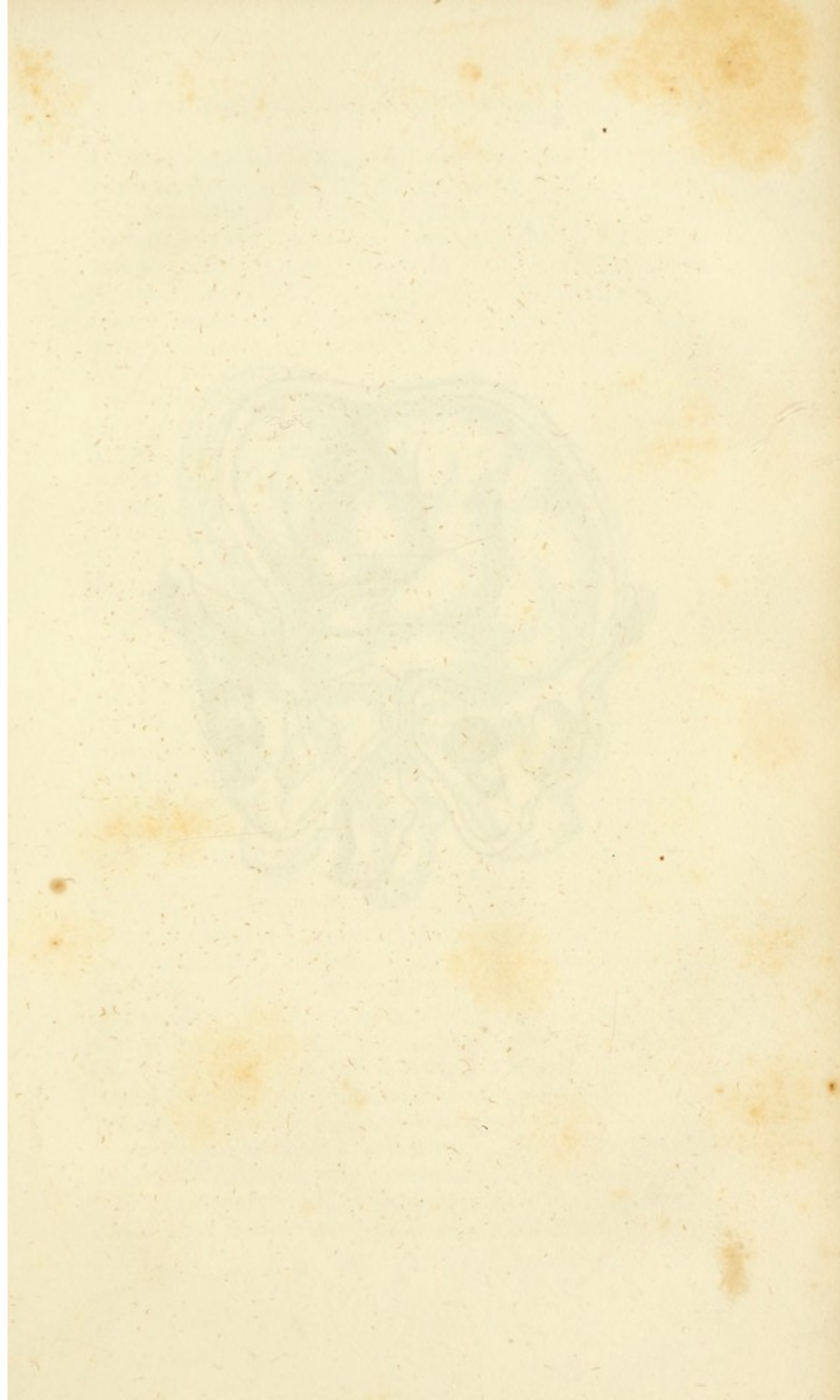
mote her easy deliverance, since she attaches to the circumstance the idea of greater suffering or danger, which, by depressing the powers of her mind, would be very apt to affect, in an injurious manner, the pains, or the voluntary efforts that she ought to have in their greatest vigour. While the nature of the case, then, is carefully concealed from the patient, it should be formally announced to her husband, or to some responsible person, and all the hazards of such a situation for the infant should be explained, in order that if any untoward event should cause the infant to be stillborn, no unjust imputations might lie against the candour, the skill or dexterity of the accoucheur.

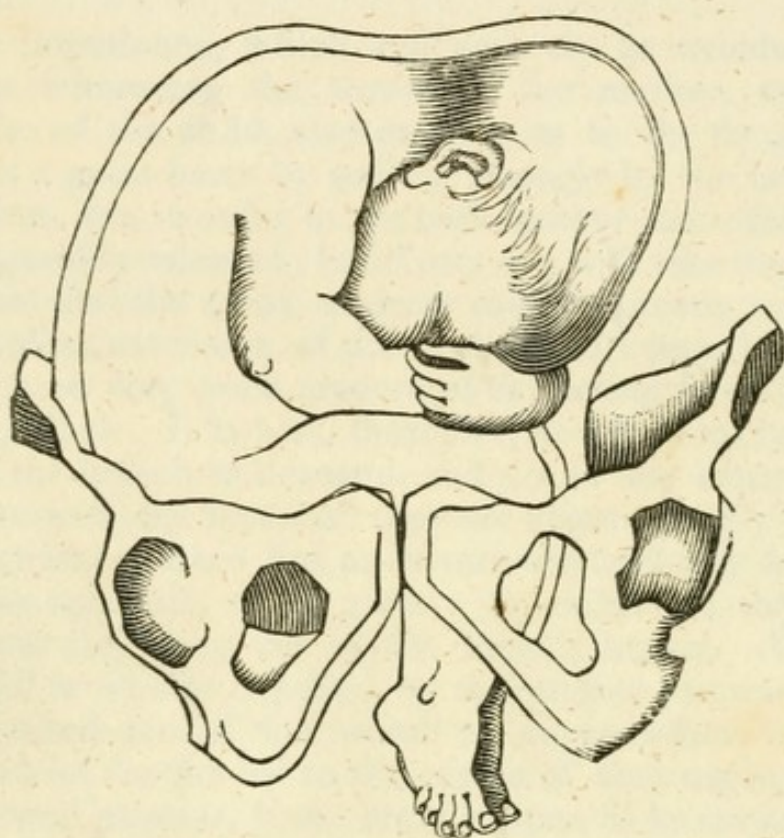
When the breech is found to be the presenting part, it is very natural to suppose that, could the feet be brought down, they would give us the command of the child, so that we could very greatly assist in its delivery; and this is quite true: nevertheless, it is bad practice to bring the feet into the vagina, except for some very well understood and sufficient cause. When the child descends *double*, as it is called, the parts yield very slowly for its advance, and this tediousness is a necessary consequence of its bulk, and the yielding nature of its structure: unlike the head, which is hard and firm, this part, when urged downwards by the pains, gives way before them, and is compressed so much that each pain is half lost before the part becomes firm or condensed enough to make it act as a dilater. This slowness is greatly to be deprecated; and all proper means to obviate it may be safely resorted to, such as a venesection, or the administration of a clyster, or a dose of castor oil, &c.; yet this very slowness, and the great size of the breech, serve as means for the child's security at the last moments of labour. By their means the os uteri, vagina and vulva are so completely opened, and so entirely deprived of the power of resisting, that, when the head comes to take the place of the body in the excavation, a very little force of the woman's straining serves to extricate the head, or at least the complete dilatation enables the accoucheur to employ his hand or his forceps to extract the head in time to save the child from an

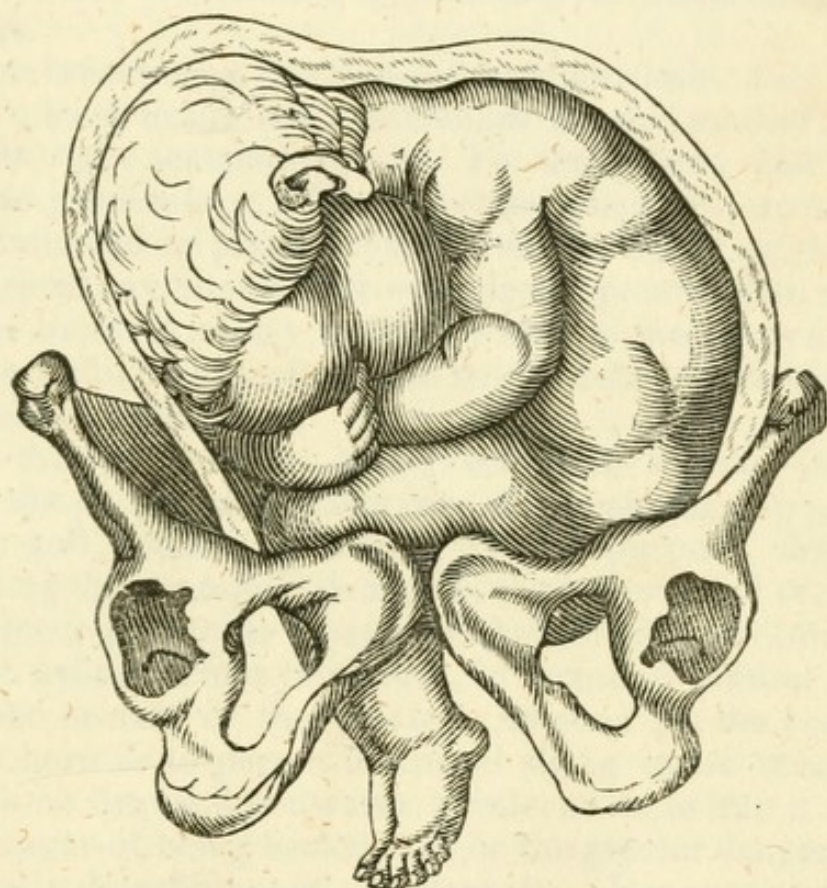
asphyxia, which is almost sure to affect children that are not born very soon after the escape of the shoulders ; because, during the time the head is in the vagina, the cord must be severely compressed ; and even if it were safely put away in one of the sacro-iliac spaces, the placenta would, by this time, be so completely squeezed by, or even separated from, the womb, that the utero-placental functions would naturally cease to be performed.

The impatience, which can scarcely be avoided by persons witnessing the throes of the mother, or the struggles of the child, also exposes us to the danger of doing it a great harm by pulling strongly by the breech, shoulders, &c. in order to get both mother and infant the more speedily released ; but if any one will take the time to reflect that the spinal marrow may be greatly injured by a violent extension of the neck, it will be evident to him that no very great amount of extracting force ought to be applied. It is best, therefore, as a general rule, to permit the breech to descend, and not in any manner to interfere with the feet until they are spontaneously born. Any extracting force has an invariable tendency to slip the arms upwards, so as greatly to embarrass the last and most important act of the breech labour. When the child is wholly expelled by the uterine contraction, it is pushed out of the womb in consequence of the approach of the fundus to the cervix of that organ. In that natural process, if the arms happen to be resting on the sides or abdomen of the child, they ought to descend *pari passu* with the parts on which they rest ; but if the child be pulled out, then, as the fundus uteri does not press with a proper power upon the head, the arms will naturally slip up over or along-side of its head, where they sometimes are so firmly fixed as to make it a very difficult matter to bring them down. Hence the soundest discretion teaches us to let the womb push forth the breech as we let it push forth the head, without laying hold of it to drag it downwards as soon as the least purchase can be had on the presenting part.

The legs, in a breech presentation, may be turned upwards on the child's belly, or they may be flexed on









the thighs, so as to bring the feet very near the nates. If the breech engages in the pelvis, or begins to pass the circle of the os uteri, the feet disappear, rising as the nates descend. There is no danger of injury to the hip or knee joint, if the child be trusted to the natural powers employed for its birth or expulsion ; but whenever much force is employed by putting the fingers in the groin, we do incur the hazard of breaking or dislocating the thighs.

The breech may have one of four positions : 1st. The child's back to the left acetabulum of the mother ; 2d. To the right acetabulum ; 3d. To the pubis ; and 4th. To the promontory. These several positions are easily discriminated in practice by the touch, which ought not to mislead any attentive or considerate practitioner, since by the touch it is easy to learn where is the coccyx, the tubera ischii, the genitals, the sulcus betwixt the thighs, the sacrum, &c., &c.

As the escape of the breech occasions a great distension, the perineum requires very steady support by pressing a soft napkin against it, for the purpose, first, of resisting the too rapid advance of the breech, and second, in order to give to its movement that curvilinear direction which ushers it into the world, in a course parallel with the line or axis of the pelvis. As soon as the body is so far born as to permit the navel string to be reached, it is to be drawn downwards a little, so as to free it from the danger of being broken off, or the greater danger of a too early detachment of the placenta. It is easy to draw a considerable loop of it downwards by pulling at the yielding portion. As soon as the feet are delivered and extended, they, as well as the body, should be wrapped in a napkin, in order that the skin may not suffer any injury, and also for the purpose of enabling the accoucheur to hold it more firmly, which he could not otherwise do on account of the viscous nature of the substances that adhere to it soon after it emerges.

In the first position of the breech, the child's left hip should rotate towards the pubis, so as to allow the sacrum to glide down along the ischium, and the right hip to fall into the hollow of the sacrum. But after the hips

are fully delivered, they recover the obliquity of their former situation, and the body continues to descend so, until the shoulders, entering into the pelvis in an oblique direction, come to rotate as did the hips, the left shoulder advancing to the pubis, and the right one falling back into the hollow of the sacrum. When the shoulders do not come down well, a finger should be passed up so far as to reach above the one that is nearest at hand, and depress it by drawing it along with the finger, which commonly suffices to cause the arm to escape. But if the arm does not descend readily, let the finger be slid along its upper surface to a spot as near as may be to the bend of the elbow, and then the elbow may be drawn downwards with a considerable force, and without any danger of fracturing the os humeri. One arm having escaped, there will be little difficulty or delay in getting the other down, especially if care be taken to move the body in a line of direction opposite to that part where the arm is detained.

As soon as the arms are delivered, an examination should be made in order to learn how the head is situated. If the face is found in the hollow of the sacrum, and the chin well down towards the fourchette, it is well. The child's body ought now to be raised upwards on the practitioner's arm, to a height sufficient to enable the longest axis of the head to become parallel with the axis of the vagina, and the patient pressingly exhorted to bear down and force the child out of the passage, for at this time the head is not in the womb, but in the vagina, and for its expulsion there is required rather the effort of the abdominal muscles than that of the uterus, which doubtless does, in many instances, partially close its orifice above the vertex, in this stage of a footling or breech case. If the patient therefore does not make a very great effort of bearing down, or expulsion, the head must remain in the passage, during all which time the child is exposed to the risk of perishing by asphyxia. It is true that the pressure of the head upon the parts tends to produce a very violent tenesmus, which compels the woman to strain very much; but it is also true that in some instances she will not make the smallest

effort, unless urged or commanded in the most earnest manner by the physician.

Some aid may be given at this critical moment by drawing the child downwards, but the attendant should always carefully reflect, while employing any extractive force, that the child's neck will not bear a great deal of pulling, without the most destructive effects on the spinal marrow. Certain it is that the infant in the birth will not safely bear more force applied to its neck than one after the birth, a reflection that ought to regulate the physician always.

If all his exhortations fail of causing the woman to assist him by bearing down, let him endeavour to preserve the child from suffocation by passing two of his fingers upwards until they reach the two maxillary bones, and cover the nose; by doing this the backs of the fingers, pressing the perineum backwards, serve to keep an open communication with the air, and the child can breathe very well until the tenesmus comes on. I have kept a child alive in this way, breathing and sometimes crying, for twenty or twenty-five minutes before the birth of the head, and thereby saved a life that must have been lost but for this care. At last the head descends and escapes from the vulva very suddenly, after which the placenta having been duly attended to, the delivery is complete; whereupon the lady may be put to bed.

A few years ago I was engaged to attend a young lady in her first childbirth. When she fell in labour, I discovered that the breech presented. Her residence was about three-fourths of a mile from my house. I was very much inclined to send for my forceps, for fear that when the head should come at last to occupy the vagina, I might be unable speedily to deliver it. But as she was exceedingly delicate and timid, and her friends anxious, I deferred sending for them lest alarm should be the consequence of bringing them to the house. The labour proceeded very favourably until the shoulders were free, and then, notwithstanding the head took the most favourable position, I found that no exhortations or entreaties could suffice to make the lady bear down, and the child soon became threatened with asphyxia,

which I obviated by admitting the air freely to its mouth and nostrils, by pressing off the perineum. The child cried, and I felt a hope that the forceps, which I now sent for, would arrive in time for its succour. The instruments were placed in my hands in the shortest time possible. In two minutes after I received them they were applied, and the head withdrawn, but it was too late to resuscitate the child. I have never since failed to order my forceps to be placed within my reach in any case of footling or breech labour, and I feel well assured that the consequence of this care has been the saving of several lives that must have been lost but for this precaution. I have lost but one child in pelvic presentation in the last three years, and that was one which was a vertex case, but which I brought footling in consequence of hemorrhage from placenta prævia, and in which I was obliged to deliver the head with the forceps, as the lady was so exhausted by loss of blood that she could not bear down.

It is my unfailing custom, therefore, to order my forceps to be put in readiness as soon as I ascertain that the presentation is not one of the head; and I feel very well assured that such a precaution, if generally observed would preserve many a life that is now lost, either by delay in the delivery of the head, or by pernicious attempts to extract by pulling at the neck, to which the temptation is so strong in moments of great anxiety for both parent and offspring.

In those cases in which the sacrum of the child is directed towards the mother's back, it is highly desirable so to conduct the labour as to effect a complete rotation of the child by the time the head begins to get pretty low in the excavation. If this change does not take place spontaneously, or by the skilful interference of the accoucheur, it must happen, at the last and important stage, that the face will be to the pubis, and then there will be some difficulty in obtaining the requisite dip of the head or its due flexion. It is exceedingly dangerous for the

child to be so situated, but happily there is a method by which it may be hopefully assisted.

As soon as the shoulders are fairly freed from the vulva, the edge of the perineum tends to compress the neck of the child, and force it upwards against the arch of the pubis. In some cases the perineum is so strong or elastic as to exert a considerable power in this way; and it is clear that if it be not counteracted, the chin may be lodged upon the top of the symphysis of the pubis, and wholly prevent the flexion of the head from taking place. Under such circumstances the child will speedily perish. The indication is then to push the perineum back again, or carry the child far back towards the coccyx, and afford space enough to let the chin descend, either spontaneously, or by pulling it down by introducing the fore and middle fingers of the right hand into the child's mouth. As soon as the chin is well brought down, the woman should use all her power to assist in the expulsion of the head. I have found that the best attitude for the mother, in this kind of delivery, is that which is advised for forceps operations, to wit, that in which she is placed on her back, with the hips brought quite over the edge of the bed, the feet being supported by two assistants; so that, when the shoulders are delivered, the child may be supported almost in a vertical posture by the left hand of the accoucheur, while his right hand aids in the delivery of the head. I am sure that much greater command of the labour may be had in this position of the patient than in any other that can be devised.

But, as I have already observed, we should endeavour to manage the case so as to get the face into the hollow of the sacrum, instead of letting the chin come to the pubis. If, therefore, the breech sink into the excavation in this unfavourable manner, we should, by pressure with two or three fingers, endeavour to force that hip which is nearest the front towards the symphysis, and if we succeed in effecting its delivery in that position, we should, with a proper degree of force, continue to turn the forward hip more and more round, so as to bring the child's spine at least as far in front as the

ramus of the ischium or pubis ; so that when the shoulders begin to enter, they may enter obliquely, and after they have passed down, the head may also enter obliquely, or at least transversely. For example, let the sacrum be towards the mother's back, the child's right hip will be on the right ischium of the mother. We might try to get the right hip towards the ramus of the ischium, then towards the ramus of the pubis, and, as it advances, cause it to emerge just under the arch. When fully emerged, the hip should be turned more and more to the left of the mother, so as to let the right shoulder enter the brim at the left acetabulum, and escape under the arch, in doing which, the child's face will enter near the left sacro-iliac symphysis, and at last slide into the hollow of the sacrum, as in a second position of the breech.

Where this desirable rotation cannot be gently effected in consequence of the grasping force of the womb holding the child's body tight during a pain, we ought to watch for an opportunity, during the absence of a pain, to push the child's body upwards again as far as we conveniently can, and then draw it downwards, endeavouring, while pulling it downwards, to twist or rotate it in the manner that is required.

If, on the other hand, we endeavour to bring the left hip to the pubis, we shall also get the left shoulder there ; at last, compelling the face to enter at the right sacro-iliac symphysis, we shall terminate the labour in the first position of the breech.

I shall here relate a case taken from my record book, which may serve to show the student what a great rotation may be effected by the hand of the practitioner, in cases of the fourth position.

Tuesday, October 5th, 1830. Mrs J., a young woman, in her first pregnancy, sent for me at eight o'clock P. M. The waters came off at five o'clock P. M. The os uteri, at my arrival, was almost completely opened. I touched the breech and feet ; the toes were towards the left acetabulum. At a quarter before nine o'clock I disengaged the right foot, and then the left one. At nine the arms were both delivered, the left one escaping first along the peri-

neum and the right one under the pubis. I could not effect any further rotation, and was sorry to find the chin immediately behind the symphysis pubis. I then turned the child's body, and pulling the chin well downwards, I pressed the face with two fingers, on its right side, and with great ease turned it into the hollow of the sacrum. I next made a channel by passing up two fingers to the superior maxilla, so as to admit air freely to the nose, and the infant breathed; there was a total cessation of pulsation in the cord. The child breathed and cried at least for twenty minutes before the head was expelled, which I could not effect until I carried its body upwards towards the mother's abdomen, and rolled her over on her right side, which gave me far better power to aid her with my right hand. The infant was born living, and did well. I shall cite another instance which occurred very recently.

On Thursday, July 14th, 1836, Mrs ——— was seized with labour pains, which came on with the rupture of the membranes. At six o'clock I made an examination, and found the left foot in the vagina, accompanied by the umbilical cord, which pulsated. The toes were directed to the pubis. I could reach the breech of the child, but the right foot was so high up that I could not touch it. In a short time the foot came quite down; and in order to rotate the body I drew moderately upon the foot, which caused the left hip rapidly to approach the pubis. I could not even yet get at the right foot, wherefore I permitted the child to descend with that limb pressed upwards against the belly; the left hip came under the centre of the arch, and as soon as I could command it, I turned it more and more round, so that when the arms were delivered, I found the face in the sacrum, soon after which the head was expelled. I immediately ascertained, that there was a second child; pains came on, and in fifteen minutes after the first one was born, I broke the membranes of the second, which presented the nates and the right foot. The foot prolapsed, but the other limb was pressed against the child's belly, so that I could not get it; the sacrum was to the right acetabulum. When the shoulders were delivered I found the child's face rather transversely directed

towards the left ischium. I brought it into the hollow of the sacrum, soon after which it was also expelled. Both children are well.

It is so easy a matter, in general, to cause the body to rotate during its transit through the pelvis, that it very rarely happens, if the physician is called early, that the face at last is found towards the pubis.

With regard to the presentations of the feet and knees, I do not know that it is necessary for me to enlarge upon them, before I close this chapter. I may remark, however, that the knee presentation is found to be embarrassing from the tendency there is to a sort of arrest, in consequence of the knees abutting against the sides or parietes of the pelvis, which is sufficient to prevent the descent of the child's nates, so that they, being thereby thrust over to the opposite side, cannot enter the excavation. Hence, where the knees present, it is advisable to convert it into a footling case, which can be done by pushing the whole presentation upwards, during the absence of pain, in order to gain space enough to bring down the feet.

The student will perceive, if he refers to the axis of the womb and that of the vagina, that in a knee case, in which the child's back is towards the left front of the mother, the thighs would be very greatly extended, or bent backwards, before they could emerge from the external organs; an extension that must be very difficult to effect where the legs are bent up on the back of the thighs—for in such circumstances the rectus femoris, and indeed the whole quadriceps muscle, must be put excessively on the stretch. It is a good rule, therefore, in knee presentations, to get the feet down as soon as it can be prudently done; whereas in the well defined breech cases, the feet ought not to be brought down, except for some valid and well understood cause.

In order to distinguish the feet from the hands, for which they are sometimes mistaken, it is only necessary to give attention to the sensations imparted by the ope-

ration of touching. The even range of the ends of the toes, and their shortness, compared with the length of the fingers; the closeness of the great toe to the one next to it, in contrast with the wide separation of the thumb from the fore finger; the ancle, and the heel, are marks that might be supposed sufficiently prominent to guard us against even the danger of mistake; yet, very great attention is in some instances required, to enable us to aver positively that the presenting part is, or is not the foot.

As the footling is but a deviation from the breech presentation, its positions are like its original form, viz. the heels to the left acetabulum; the heels to the right acetabulum; the heels to the pubis; and lastly the heels to the sacrum. As the treatment is precisely the same as in presentations of the nates, I shall not detain the reader by any further remarks upon the management of them.

CHAPTER XV.

OF PRETERNATURAL LABOUR.

ANY labour that cannot be brought to a safe conclusion by the natural powers of the system, might be denominated a preternatural labour; and as the causes that might prevent the accomplishment of the parturition except by the help of art, are very numerous, it follows that there are a great many kinds of preternatural labour.

A labour may be accidentally changed from a natural to a preternatural one; or it may possess a preternatural character from the very beginning, and be unavoidably so. Thus, a woman may have brought her child almost into the world without any appearance of disorder, or danger, or uncommon distress, and then suddenly be attacked with convulsions, apoplexy, hemorrhage or laceration of the womb, &c., &c., either of which occurrences changes the character of the labour completely. Or, she may, in consequence of disease or accident, be incapable of bringing her child into the light without surgical aid, as where the passages are closed by stricture, or by some fibrous tumour, or by a deformity of the bones of the pelvis. Lastly, the labour may be preternatural because there presents at the strait some portion of the child which cannot pass through, but must be put aside in order to let some other part advance, before the labour can be brought to a close. For example, if the arm or shoulder should present, it is necessary to put them out of the way, and bring the head back to the opening, or

else the feet must be brought there, and the child turned quite over, for one or the other of the extremities of the foetal oval must advance, in order to admit of the escape of the child.

It appears from the above that the causes which constitute preternatural labour are very various; and it is reasonable to infer that the medical and obstetric treatment of the several cases will be founded upon the peculiar and distinguishing character of each individual example of the labours. The subject, therefore, embraces so wide a field of discussion and detail, that it will be requisite to treat it according to the nature of the several causes that happen to interfere with the natural process of childbirth, and I shall endeavour to describe the different sorts of preternatural labour, according to the circumstances which make them what they are, and point out the modes of treatment most suitable to their several natures.

It matters not which kind of preternatural labour is first treated of, for there is no natural order or method of their occurrence; each one might be the subject of a separate monograph; but I have chosen to commence with the account of presentations of the shoulder, as one in which the operation of turning is inevitable as a part of the treatment; and since that operation is not unfrequently resorted to in other specimens of preternatural labour, I deem it of some advantage to take an early opportunity of describing it.

I have already said that one of the extremities of the foetal oval ought to present at the opening, in order to constitute a natural labour; and I have treated of the pelvic presentations as being natural; and I have supposed that the knee and footling cases are but accidents or deviations of the natural pelvic presentation.

In presentations of the head there is also a liability to deviations, by which the head glances off from the brim of the pelvis, and is turned upwards into the costa of the ilium, or rises above the top of the pubis.

In a case where the direction of the uterus is very oblique, so as to allow the fundus to fall far down into the right flank of the patient, the child, if pressed by the

contractions of the fundus, might be pushed towards the left side of the brim of the pelvis in such a manner as to make it doubtful whether the head would enter the strait, or slide upwards on the left side of the womb. For the most part, it fortunately happens, even in the very greatest lateral obliquity of the womb, that the head is not deflected, but enters the strait; but in a few examples it is found to rise upwards, instead of engaging. When this takes place, it must almost inevitably happen for the shoulder to fall into the cavity from which the head was turned away, and as the shoulder is a projecting part, it is very liable to maintain the position in which it is once ensconced. The shoulder, therefore, when the head glances off, descends or engages in the superior strait, and is pushed downwards by the uterine contractions as far as it can possibly be urged, and there it stops. The strait is jammed full; and when no additional portions of the child can be pressed into it, a total arrest of the progress takes place, and the woman, after vain struggles, protracted according to the strength of her constitution, sinks, at last, without the possibility of rescue from death except by the skilful aid of the obstetrician.

There can scarcely be any need for me to enlarge upon the impracticability of delivery here except by art; for even could the shoulder be pushed down as low as the vulva, it would happen, at last, that the head would be again brought to the strait from which it had been turned off, but it would be accompanied by the child's body, either of which, alone, is sufficient to fill the excavation, so that the two together could by no means pass through. The remedy is to push the shoulder out of the way and to bring the child's feet down so as to deliver it footling, or to restore the head to its proper place.

I ought to remark that while the shoulder presentation is a deviation or accident occurring in an original head presentation, so it may happen that, instead of the shoulder, the hand or elbow may come down, but at last they are mere circumstances of a shoulder case, and when they are advanced to a certain degree, it is the shoulder that, after all, fills the strait and the excavation, and which constitutes the obstruction. The hand and

arm are merely prolapsed, and their prolapsion adds nothing to the difficulty of the case ; in fact, their prolapsion serves as a means of guiding us in our diagnosis, and does not at all oppose the successful treatment of the labour. In the management of a pelvic presentation I should, in general, prefer that the feet should not prolapse ; in a shoulder presentation it would be rather a favourable circumstance for the arm to prolapse.

As there are two shoulders, a right and a left one, there must be a set of positions for each shoulder ; but in determining which is the position of the shoulder, it is also necessary to determine the situation of the child's head. In speaking of natural labour, with the vertex in the first position, I endeavoured to explain the causes which give a greater number of first positions. The same reasons operate to produce, in shoulder presentations, a greater proportion of instances in which the head is to the left side of the pelvis, than of those in which it is to the right side. Now if the right shoulder presents at the strait, and the head is to the left, the face of the child, and its toes and feet will look towards the mother's back ; but if the same shoulder presents, and the head is to the right side of the pelvis, the face and front of the child must look towards the mother's front : so of the left shoulder in the first position, the face will look in front, and in the second position it will look towards the mother's back. By speaking, therefore, of the positions of the two shoulders separately, we get a better and less complex idea of this sort of labour than we should have were we to enumerate a set of positions without such a division.

I think that the form of the foetus and the capacity of the womb are such as to make it unnecessary to establish more than two positions for each shoulder, e. g. for the right shoulder a first position, or that in which the head is to the left, looking backwards, and a second in which the head is to the right, and looking front ; for the left shoulder a first position, wherein the head is to the left, looking front, and a second in which it is to the right, looking towards the back of the mother. This will, I think, be quite sufficient, and gives us four posi-

tions for the shoulders, hand or elbow. It is not to be denied that the head might be in front, looking to the left or looking to the right side of the mother, giving us, in the former case, a right shoulder, and in the latter a left one in the strait; but it is needless to enumerate such a position, as the contractions of the womb would soon turn it into one of the attitudes I have before pointed out.

The signs by which a shoulder at the strait may be diagnosed, are, 1. The want of the regular form of the bag of waters, which in all preternatural presentations is without that proper convex shape that we notice in favourable instances of natural labour. When the membranes pass down into the vagina, shaped almost like an intestine, or of a cylindrical form, there is good reason to think there is something untoward in the posture of the infant. 2. The spinous process of the scapula; the clavicle; the round-shaped shoulder; the axilla; the ribs; the arm, distinguishable by its size from the thigh. Should the attendant retain any doubts, let him never omit to remove those doubts by the introduction of his hand into the vagina, where he will be able freely to examine the nature of the presenting part, and learn its true position. No person is excusable for mistaking the diagnosis who knows he can command so infallible a method of making a correct one. The diagnosis can always be made in good time,—i. e. as soon as the dilatation will admit, and until then nothing can be done.

Having ascertained that a shoulder is at the strait, there remains but one determination for the practitioner, and that is to put it away and bring another part of the child to present. This necessity, and the hazard in which, consequently, both the mother and child are involved, should be plainly and seriously laid before those who have the best right to know her case; viz. her husband or parents, or such near relatives or friends as may seem to be, for the time, in loco parentis for her. The necessity for interference ought also to be explained to the sufferer herself, but in the gentlest and most cheering manner possible. If it be within the bounds of possibility to do so in good time, a medical brother ought to be invited,

in order that his counsel may be taken, and particularly that the friends, and the patient also, may have no doubt left in their minds as to the propriety of the operation, nor claim the least right to find fault afterwards with the physician, should any untoward event follow the plan he had recommended.

But no operation can be performed while the os uteri is so closed as to refuse admittance to the hand. It cannot, and must not, be forced. The mouth of the womb must be dilated or dilatable before any operation is lawful; it must be dilated or sufficiently yielding to allow the hand to pass upwards into the uterine cavity; of this degree of dilatability the obstetrician is the only judge. He must never run the risk of tearing such an important organ, since its laceration by his hand would be much increased by the following birth of the child, and place the woman in danger of sudden death; or he might contuse the parts so much as to establish a very dangerous inflammation of the organ. So important is it to judge aright concerning the *time* to be chosen for the exploration of the womb, that it is thought to be the most responsible duty of the physician in the whole case. If he proceed too soon, the most lamentable consequences are apt to ensue; and if he defer the procedure too long, the difficulties and dangers are greatly enhanced by the delay, while the patient also suffers useless and pernicious pain. The bladder and rectum should be evacuated before the operation. The position should be carefully ascertained; this can be done by the introduction of the hand, if necessary, into the vagina; and if it be certain that the left shoulder presents with the head on the left side of the womb, then he must make choice of that hand which can most conveniently be employed in the operation. The rule is to use that hand whose palm, when opened in the cavity of the womb, would look towards the face or breast or belly of the child, which, in this instance, would be the left hand; for it is clear that if the right hand were used, it would not apply the palm to the front of the infant whether it were carried up before or behind the child's body.

The best position for the patient is that on the back, with the end of the sacrum brought quite over the edge of the bed, the feet and knees being carefully supported by an assistant, holding each limb, which should be properly flexed. The woman ought to be carefully covered with a sheet or a light blanket, according to the season of the year, and some thick cloths should be placed on the floor, under the patient, to receive any discharges of water or blood that might accompany the operation.

Every thing being fully prepared, the operator's arm should be bared up to the elbow, and well anointed with lard, while a sufficient quantity of the same material should be applied to the external parts. During a pain, two fingers, and then three, of the left hand, should be passed into the vagina, to be followed by the little finger, and afterwards by the thumb, strongly flexed into the palm. The hand having gained possession of the vagina, may then rest while the pain is gone off, after which the presenting part must be pushed upwards and backwards, the fingers and whole hand following the receding shoulder into the cavity of the womb. The shoulder being moved somewhat to the left, as it mounts upwards, when the hand is fairly introduced, it ought to be opened and glided along the breast or abdomen towards the feet or knees, which will be looked for on the right and superior portion of the cavity. In searching for the feet, the contractions of the womb are excited, and pains are produced, especially if the waters are much drained off. During these contractions it is absolutely necessary to open the hand, lest the uterus, from the violence of its own action, might be torn on the knuckles, and the hand ought never to move except the organ be in a state of relaxation. At length, after more or less research, one or both feet, or a knee is found, and whether it be one or the other it should be taken hold of; for it is a matter of indifference nearly whether it be one foot or both, or one knee that is used as the point on which to act in turning the child. I say nearly a matter of indifference, because, the object being to turn the child as soon as practicable, with proper caution, it may be effected in

either of these ways : it is always desirable to get the hand out of the uterus as soon as may be, and it is far better to turn by one foot or by a knee, than to incur the risk of laceration or contusions of the organ, by a tedious search after the other foot, which, if it be not originally near its fellow, is very hard to be found by any search after it.

Having found the foot, if a pain comes on immediately, and becomes a severe one, the foot should be let go, and caught again after the pain is gone off, according to the discretion of the operator. During all the time he is passing his hand up and exploring for the child, either his own hand or that of an assistant should be applied to the fundus, in order, by pressing it downwards, to keep the os uteri within the strait, and when he is ready to turn the child, his own right hand should be used by the operator to press on the outside of the abdomen, so as to favour the version by pushing the breech of the child downwards, while he also draws it downwards by the feet or knee. If the hand ought not to move during a pain, it would surely be the height of rashness to attempt to turn the child with the womb in a state of contraction. The time for turning ought to be chosen as soon as the pain has gone off. Then the womb feels yielding and soft as a wet bladder, and the part held may be drawn towards the os uteri slowly and gently, but firmly, and, if possible, brought quite into the vagina, or even to the vulva. External pressure with the right hand favours this version very considerably, and ought not to be neglected.

It is easy to ascertain if the version be complete by external taxis, and by noticing how far the child is drawn downwards, and judging of its length as compared with the length of the uterus, as well as by noting the effect of the next pain, which propels it if it be turned, but does not move it if it be still transversely fixed in utero.

Wherever it is possible to make choice of a foot to pull on, we should select that which is nearest the front of the pelvis. In the present case it would be the right foot, because in drawing upon that one, the right hip would come under the pubic arch, and favour very de-

cidedly our wish to bring the vertex at last to the pubis, and carry the face to the hollow of the sacrum ; whereas, should we draw down the left foot, the child's face would, at last, be very sure to come to the pubis.

As soon as the turning is complete, the case has become a footling one, and must be treated as if it were originally so ; i. e. it should be left to the expulsive powers alone, if they are sufficient, for it is always bad and almost always unnecessary to draw out the body ; it should be expelled by the pains. The arms must receive such assistance as they may need ; and the head, being properly situated in the vagina, ought to be expelled by the womb with such aid, from slight tractions, as the obstetrician may adventure with safety to make.

In going about to perform this operation, the attendant ought to reflect upon all the dangers incident to it, and clearly understand, beforehand, that what is most desired in it is, not speed, but safety ; *festina lente* ought to be the motto. As to the difficulties of it, they are so great, in a womb long drained of its waters, and lashed into fury by a long period of unavailing irritation, suffered previously to the operation, that nothing but practical experience of them can make them known, unless indeed the fact be understood that it cannot, in some instances, be performed at all, and that we are obliged to extract the child double, after having removed the thoracic viscera, as well as those of the abdomen, by the crotchet and perforator ; after which the foetal remains may be drawn forth.

I have, after having had my hand in the womb, found it so completely benumbed by the pressure, as to be unable to feel with it or to close it ; in such a case, the other ought to be made use of, however ill adapted either for the exploration or seizing the feet, &c.

The child being delivered, the mother must be drawn up into her bed, so as to enable her to stretch out her feet, and as soon as the placenta is taken away, she should be bandaged and put in bed. A grain of opium, or a proper dose of laudanum, is very soothing and calming, after such high excitement and fatigue, and ought not to be withheld from her. A cup of tea or gruel may next

be presented to her, and a short sleep, if she can take it, is followed by a comfortable state, for the before exhausted woman.

There is very little difficulty in this operation, if the waters are not gone off; they should, therefore, be always left whole if possible. Could we indeed always have the privilege of rupturing the ovum at the time of carrying the hand into the womb, we should avoid much difficulty, and a large moiety of the danger of doing mischief.

There are very ignorant persons, who are generally the more præsumptuous the more they lack knowledge, into whose hands women are so unhappy as to fall on occasion of the childbirth. If, in a shoulder presentation, the hand happens to prolapse, they, finding a very convenient handle, make use of it to pull the child away by; and I have seen a case in which an unfortunate woman had been so treated. The arm was wholly withdrawn, and the coracoid process of the scapula was actually under the pubic arch; so violent were the tractions that had been made on the hand and arm. This was done too with a rigid os uteri, which, after yielding a reluctant passage for the arm and point of the shoulder, was now grasping the parts above it with a strength like that of a rope, and which afterwards resisted, for a long time, all attempts to pass the hand along betwixt its circle and the child.

There cannot happen any thing but evil from pulling at the hand and arm. Such force cannot pull the child down, for it is too large to pass doubled. The hand, actually, is not in the way, for the hand of a practitioner and the arm of a fœtus at term, can never equal in size a circle sufficiently large for the head to pass through it. The lack of space is not in the faulty construction of the pelvis, but in the rigid constriction of the os uteri, which if too rigid to admit the hand, is also too rigid to allow the child to escape. That rigidity can be overcome. It cannot be needful to excise the arm, or twist it off at the shoulder joint, a horrid practice, which seems to have received a salutary check from a judicial investigation that was had a few years since in France: a prac-

itioner there, finding it impossible for *him* to deliver in an arm presentation, cut it off at the shoulder joint, and nevertheless the child was born alive. The obstetrician was justly prosecuted on a charge for maiming.

If the os uteri will not admit the hand of the accoucheur, it is because it is not dilated or dilatable. Let the proper measures, then, for effecting the requisite change in the uterine tension be resorted to. They are bleeding; the warm bath; antimonials; emollient enemata, followed by enemata of laudanum; and patience, though last, not the least of the resources for such an occasion. Women in labour bear venesection remarkably well; and they demand, in some instances very great abstractions of blood in order to get the full benefit of the relaxing efficacy of that remedy. A patient bled *ad deliquium animi*, will be more capable of undergoing safely the operation of turning, than one left to the unmitigated excitement of useless labour pains.

The warm bath is a safe and an easy remedy for the obstinate constriction of the orifice, as it is for all spasms and other congenerous disorders. Tartar emetic, in doses of the eighth or sixteenth part of a grain, repeated every thirty or forty minutes, conduces very powerfully to the reduction of the spasm or rigidity, and it may be very safely resorted to in the management of our case. Copious enemata of infusion of flaxseed, with a portion of castor oil to render it somewhat more aperient, should be had recourse to, and they may be followed by anodyne enemata, composed of an ounce of flaxseed tea or starch, with from fifty to eighty or one hundred drops of laudanum. We should, also, not forget that patience ought to work her perfect work, and no more: the accoucheur must be the sole judge of how far patience ought to go.

There can never be the least use in attempting to return the arm. The arm will be withdrawn by the version of the child. It goes upwards into the womb as the head rises, and the breech descends. It would be always prudent to secure it by a noose, for the purpose of preventing its going too high within the cavity, where its presence might cause some embarrassment in the delivery of the head.

Labours are also rendered preternatural by the occurrence of hemorrhage from the womb ; for, although it is very common, and not unfavourable for the parturient woman to have an issue of blood during some part of the process of childbirth, it is not either safe or natural, for her to lose so much blood as to give to the flow the character or title of hemorrhage. In general, the quantity lost antecedently to the birth of the child, does not exceed an ounce, and it is commonly even less than that. The occurrence, therefore, of a show of blood, need not, and does not, excite any alarm or even surprise, unless it goes beyond the ordinary amount. But where the effusion becomes excessive, great alarm is felt, and there is more or less danger according to the cause of the accident.

I have already indicated my opinion of the mode of connexion between the placenta and the womb ; and the student will have seen that I do not admit that any very large vessels pass from each to the other, interchangeably. Hence, when blood escapes from the uterus, it must be, I think, in consequence of an hemorrhagic nîsus or sanguine determination, like that which sometimes causes the effusion of blood from the Schneiderian membrane, in those cases of epistaxis that come on spontaneously. We often see very copious outpourings of blood in epistaxis, where we can have no reason to suspect any rupture of vessels or solution of continuity in the membrane. The same thing takes place in the pulmonary hemorrhage, and in hæmatemesis. But as the womb, from its very constitution, is prone to the hemorrhagic affection, it is more liable than any of the organs, to losses of blood, without the suspicion of rupture of its tissues.

The gravid womb is filled with the ovum, which is really connected with the containing organ only at the placental superficies. All other points of the ovum, except the placental portion thereof, adhere so slightly as to be capable of the easiest detachment. The placenta itself may commonly be separated with great facility,

from the surface on which it sits. When the chorion is detached from the womb, very little or even no blood escapes; but when the placenta is torn off, the womb generally bleeds very freely. Hence, large effusions of blood, in labour, indicate that the placental surface of the womb is exposed by the separation of the afterbirth from it.

If the afterbirth is torn off, or in any manner separated from its place, the womb still remaining undiminished in size, it is evident that the blood may continue to flow for an indefinite period, and that the woman may be brought into great danger thereby, for the bleeding orifices may continue to have, for an indefinite term, the same degree of dilatation as that which first caused them to bleed. Supposing the superficial content of the gravid uterus to be two hundred square inches, and that of the non gravid womb to be only three square inches, then, it is evident, that the great desideratum in uterine hemorrhages, before delivery, is to empty the organ as soon as practicable, in order to reduce its superficial content, as nearly as may be, to the smallest number of square inches, or to the non gravid state. In treating the cases of alarming hemorrhage, therefore, we should ever keep in view the fact, that if the womb be allowed to contract, or condense itself, its own muscular fibres will, by their contraction, lessen the calibre of all the blood vessels that are distributed on or in the organ, and in proportion to this condensation or contraction, will be the certainty of arresting the sanguine effusion. It is not only the orifice that is closed, but the whole *tractus* of the vessel is constricted.

If a labour should commence ever so favourably, with the child presenting the vertex in the first position, and the pains should propel the child downwards, so as to give reason to think the process about to terminate in the most happy manner, yet it might happen that hemorrhage should commence, and continue so abundantly, as to make it absolutely necessary to deliver the child, in order to let the womb contract perfectly. This delivery by artificial means converts the labour, which commenced naturally, into a preternatural one. We should hardly be inclined to call that a preternatural

labour, which, though accompanied with a great effusion of blood, should terminate well, without any assistance on the part of the accoucheur.

There may also be a very copious and dangerous effusion of blood between the birth of the child, and the delivery of the afterbirth; and even when the afterbirth has been discharged, the flow of blood may be so considerable as to involve the woman in the greatest danger. In the management of all these kinds of bleeding, the same indication is to be kept always in view; to wit, the condensation or contraction of the womb; for when that organ is truly contracted and condensed, the blood does not flow so abundantly as to endanger the patient, except in some very rare, and almost unheard of cases.

But among the causes of uterine hemorrhage, there is one which has been called the unavoidable cause, which is, perhaps, the most dangerous and difficult to manage: I mean that case which depends on the situation of the placenta happening to be on the cervix and os uteri. This is essentially a hemorrhagic labour, inasmuch as the mouth of the womb must not only dilate, but must dilate completely, in order to admit of our carrying out the great principle, the final condensation of the womb. Such an hemorrhage begins very moderately, but as larger and larger portions of the placenta continue to be detached with every successive dilating pain, it follows that the nearer the womb is to its complete dilatation, the more profuse and dangerous will be the hemorrhage.

There are other examples of hemorrhage, in labour, that depend on laceration or rupture of the organs, which, in common with the other kinds, will now receive a portion of our attention.

Every considerable effusion of blood in labour does not demand the manual or instrumental assistance of the accoucheur. A woman may shed a quart of blood, and yet the pains may suffice to expel the foetus in a natural way, after which the flow ceases. It is the effect, or the probable effect, of the bleeding, that renders it needful to interfere. If the pulse begins to grow small and frequent, the patient becoming weaker, the countenance paler, and the pains less energetic, we have to resolve what course

we must take, and then resort to some of the numerous expedients for checking the discharge.

If the pulse in uterine hemorrhage be full and throbbing, and the constitution not affected with debility, we may, with great safety and propriety, have recourse to a bleeding from the arm, in order to lessen the momentum of the blood, which, by its too great impetuosity, tends to keep up the flow and the determination to the womb—just as we would bleed in a pleurisy or hæmoptoe, with a similar view. Such a course, however, would be very strongly contra-indicated in the case of a feeble pulse, and a general state of weakness, faintness or sinking, where there would be no reasonable ground to hope for relief by the use of venesection.

The application of cold to the hypogastric region, is often found to have a good effect in checking the sanguine effusion, and should be freely resorted to by stuping the lower belly with napkins, hard wrung out of cold vinegar and water; the application being renewed from time to time, until we are satisfied that success is, or is not, to crown our efforts. During the employment of the above mentioned means, the patient ought to be placed in a horizontal posture, with the head very low, and the body covered only with sufficient bed clothes to keep her comfortable,—the apartment should be freely ventilated, and the patient allowed to take any reasonable quantity of iced water, or lemonade, while she at the same time makes use of the *infusum rosæ rubræ* with elixir of vitriol, or the *plumbi acetæ* with opium.

Such are the general means of repressing the sanguine movement towards the womb; but these means do not suffice always, and we ought to examine by the touch, in order to make sure, if possible, of the cause of the hemorrhage. If, upon inserting the finger within the os uteri, no portion of the placenta can be felt, and the membranes are found to be unbroken, we may perhaps resolve to rupture the ovum, with a view to diminish the size of the womb by letting its waters run off. If a quart of water should escape from the organ immediately after the breaking of the membranes, the superficies of the womb, and of course the placental superficies would be sensibly lessened, since the organ contracts as

soon as the escape of the waters permits it to do so. This is the method proposed by Louise Bourgeois, a female practitioner in France, many years ago, and it is found to answer perfectly well, in many cases.

There are circumstances, however, that might well induce one to defer, to the latest period the breaking of the ovum; such as a known bad presentation of the child, requiring it to be turned. In such a case, no prudent person would be willing, without an absolute necessity, to permit the water to escape from the womb, previous to dilatation, since the operation of turning is vastly more difficult, when performed in a female from whom the waters have been quite evacuated, than in one in whom they are still present. Hence, if the mouth of the womb be still very rigid and undilatable, rendering it impossible or improper to introduce the hand for turning, any prudent person would give a very deep consideration to the question, whether the membranes ought to be broken or not; and would certainly feel inclined to defer, till it should become unavoidable, the rupture of the membranes.

If, upon rupturing the ovum, the flow of blood should not be stayed, and the os uteri should still continue to be so rigidly contracted as to make it impossible to turn the child, recourse should be had to the ergot, in very small doses, with a view of producing a feeble ergotism, or tonic contraction of the womb, not severe enough to injure the child, but yet, so strong as to condense the uterine tissue sufficiently to arrest the flow of blood from its vessels. With this purpose, five grains of the *secale cornutum*, in powder, ought to be administered every half hour or every hour, according to the pressing nature of the demand for its aid; or a tea spoonful of the vinous tincture of the same article, might be exhibited, at proper intervals, with the same view.

There is, in general, under these circumstances, a strong disposition to make use of mechanical means of stopping the hemorrhage, such as the application of napkins to the vulva, strongly compressing the orifice; and, also, the plug or tampon, which, filling the vagina, is supposed to favour the coagulation of the blood. But, if it be remembered that the bleeding orifices are near the fundus uteri, and that the extravasated fluid trickles

down betwixt the chorion and the womb, from the fundus to the orifice, I think it will be seen that such mechanical means can scarcely exert any other than injurious effects in the case. They may enable us to conceal the fact, both from the patient and from ourselves, that the vital fluid is escaping in a dangerous abundance; but common sense ought to show us, that while we may prevent the fluid from falling out of the orifice of the vagina, by plugging that orifice with sponge or other materials, we do not prevent it from flowing back upon the outer surface of the ovum and the placenta, both of which it detaches more and more completely from the womb, leaving the woman exposed to greater hazard than she would incur were we to permit the blood to escape as fast as it is effused. Such methods, assuredly, will not favour the arrest of the effusion, by coagulation; the source of the flow being too distant from the remedy. It is, in general, better, in uterine hemorrhage, to let all the blood that escapes from the vessels, also escape from the vagina. When the uterine superficies is diminished, the bleeding is stayed. The application of cloths, wrung out of iced vinegar and water, to the hypogastrium, is of greater avail, and far more safe than the tampon. I would gladly urge upon the student the necessity of the greatest caution in the employment of so dangerous an agent as the tampon, except in the early stages of gestation, or where the capacity of the womb is not sufficiently great to admit of its containing a great quantity of blood. No hemorrhage is so dangerous as the concealed hemorrhage.

Whenever it is clearly ascertained that the period has arrived for the delivery to be hastened, which is known by the state of the patient's strength, the pulse, the colour of her lips and cheeks, and by the dilatation or dilatability of the mouth of the womb, preparation should be made for the operation by placing the woman at the foot of the bed, as in the case before mentioned. The choice, whether it is to be of the hand or the forceps, will turn on the degree of advancement of the head, which is readily seized by the forceps, if low in the pelvis, but which is pushed away to make room for the search after the feet, provided it be still within or above the brim of the pelvis.

In all cases, wherein the vertex is to the left side of the antero-posterior diameter of the pelvis, the left hand is to be used ; while the right hand is adapted for turning, in all examples of labour where the vertex is to the right half of the pelvis. The operation differs, in no respect, from the one already described, except that the head must be pushed out of the way, instead of the shoulder. If the head should have already occupied the upper strait, that strait would be nearly filled with the mass ; the hand could not be carried up alongside of it. The palm of the hand, therefore, being placed underneath the head, would push it gently upwards, in the absence of pain, and carrying it to one side, it would be retained on the brim, by the wrist or arm of the physician, which occupies the space recently in possession of the head. The exploration or search for the feet, would be conducted as in the case already treated of.

When I come to speak of the use of the forceps, I shall say what is requisite concerning the indications and manner of its use in the hemorrhagic affections ; wherefore, it seems by no means needful for me to anticipate here, what I shall feel obliged to say in a future page of this book.

The unfortunate location of the placenta, or the cervix and os uteri, is an accident which does not very frequently happen, and which, when it does occur, can scarcely ever fail to produce much anxiety and alarm among all those who understand the case, and feel any interest whatever in the mother and her offspring. The after-birth may cover the os uteri so exactly, that the very centre of the placenta may correspond to the orifice. The danger is enhanced by as much as the location is more central, that case being the least dangerous in which the edge of the placenta is nearest to the os uteri.

The occurrence will not be discovered until about the seventh month, a term at which the cervical portion of the womb begins to expand, in order to become a part of the general containing cavity for the ovum. As soon

as (in the seventh month) the cervix begins to stretch, parts of the placenta are broken off or detached from the surface of the womb, and a flow of blood, more or less violent, soon ensues, but which stops as soon as the patient lies down, or makes use of a venesection or some cooling drinks. The flow having been concluded, it is thought to have depended upon some strain or shock, &c. &c., and the patient, having recovered, goes about her usual occupations. In a short time, the further expansion of the cervix detaches a fresh portion, and the exposed womb bleeds again. These attacks of bleeding are renewed again and again, until, by their violence, or the weakness they produce, such an alarm is taken, that an examination per vaginam is proposed, and acceded to, when the cause of so much bleeding is discovered in the fact of the unfortunate location of the afterbirth. It does not invariably happen that the woman bleeds previously to the attack of labour pains, but it is far too general an occurrence, not to cause the danger of such frequent repetitions to be kept before our eyes, until the patient is finally delivered. The loss of blood, by repeated attacks, during the last two months or six weeks of gestation, renders the subject of them far less capable of bearing the frightful effusion with which she is menaced for the day of her parturition; and one woman who might go into labour with a good stock of strength, could bear, without injury, a very copious draught on the sanguine mass, whilst another one, with vessels already drained, should sink, from the further exhaustion of a few ounces.

The presence of the placenta at the os uteri, or placenta prævia, is denominated the unavoidable hemorrhage. The case should be always suspected to exist when pregnant women are attacked with hemorrhage from the seventh month to the term; and the existence of it should be verified or disproved by an examination. If it be found to exist, then the friends of the patient, but not the patient herself, ought to be notified of the nature of her position; full instructions ought to be prepared for the management of any future attacks in the physician's absence; and the services of another medical practitioner should be

retained for all sudden emergencies, during the absence of the regular attendant. By such attentions as these, the patient might confidently expect to secure the services, of at least one medical man, should her own regular physician be haply engaged, when her time of suffering arrived.

When the placenta is *prævia*, it will be almost certain to produce a bleeding before labour comes on. But that bleeding will be far more likely to occur in a woman who exposes herself to fatigue and various causes of excitement, or to accidents, than in a woman who keeps herself quiet, carefully avoiding to make any great exertion, or experiencing severe emotions of the mind. In all cases of a strong predisposition to bleeding, an increased momentum of the blood augments the predisposition. Hence, cooling diet, gentle aperients, small venesections, and repose, and relaxation from labour, ought to be very carefully prescribed for our patient. The friends should be enjoined to give us the earliest notice of the attack of labour pains, or flooding, so that, all preparations being complete, we may have nothing to embarrass us in the exercise of our judgment, during the actual progress of the labour.

The hazard of perishing, to which the patient is exposed, depends on the dilatability of the os uteri, and the strength of the pains to be employed in dilating it. If it be soft, and the pains strong and good, the dilatation may be completed so rapidly as to prevent the effusion of any very great quantity of blood. If, on the contrary, it be rigid, and yield very slowly to the feeble contractions of the fundus, the loss of blood may be very great, and the woman sink before the mouth of the womb becomes prepared for the introduction of the hand. There is no more important doctrine, in operative midwifery, than that which avers that we must never presume to force the uterus until dilatation or dilatibility abstracts from the operation of turning, one of its most objectionable characters.

Dr Collins, in his late work, speaks so sensibly upon this subject, that I cannot refrain from quoting the following passage from page 93 of his book.

“ I know of no circumstance *so much to be dreaded*, as the forcible introduction of the hand where the parts are in a rigid or unyielding state ; for although turning the child is the established and most desirable practice, yet the success of this operation will mainly depend on the judgment of the practitioner, in selecting the most proper and favourable time. Cases will happen where he is obliged either to suffer his patient to sink from loss of blood, or proceed to deliver when the parts are in an undilated and rigid state, in order to afford her the only chance of life ; but dire necessity should alone compel him to hazard the consequences of such violence.”

Such is the language of Dr Collins, who has witnessed a vast number of labours, and whose ample experience gives him a title to speak as of authority upon this and all other subjects connected with midwifery.

The time for delivery having arrived, the woman, if sufficiently strong to bear it, should be brought to the edge of the bed, and placed on her back ; otherwise, she should not be moved, but attended to as she lies. If the head present, and the position be unknown, we ought to infer that the vertex is to the left acetabulum, which is the most common one, and of course commence the operation with the left hand. By means of the fingers, we soon learn which side of the uterus is detached from the placenta, and then conduct the fingers in that direction, dilating the womb as we proceed, and carrying the fingers as far upwards as we conveniently can, betwixt the womb and the chorion. The membranes may then be ruptured high up in the uterus, and the feet immediately sought for ; the child should be turned as speedily as possible, with proper regard to its safety and that of the mother ; and the legs, and even the thighs, should be drawn into the vagina, not only with the view of expediting the delivery, so as to permit the womb to contract, but also in order that the thighs or body of the child may, by compressing the bleeding parts, arrest or impede the flow, and thus save for the patient as many ounces of blood as possible. It is to be remembered that it is the loss of the last half pint of blood that kills the patient. I think that no prudent person would undertake to pierce

the placenta, in order to get the hand within the womb. There never can be so much difficulty in detaching, as there would be in piercing the organ : and these two objections lie against perforating it, viz. that the rupture or laceration of its vessels could not but be destructive to the child, which would bleed to death ; and also, that if the feet should be dragged through a perforation made in the placenta, the final delivery of the body and head might be very much retarded, by having that mass to pass through, in addition to the other obstacles to the birth ; and further, it is evident, that in perforating the placenta and extracting the child through its centre, the organ could scarcely fail to be very completely detached from the womb. It is best, therefore, in all cases, to pass the hand betwixt the placenta and the womb, and not through the placenta.

A strong desire to reinforce the tonic contractility of the womb would induce me, always, to exhibit a portion of the *secale cornutum*, in these cases, taking care to time the dose so as to secure its operation for a period posterior to the delivery of the child. The *ergot* should be in readiness, and given as soon as the turning is completed. If it should operate successfully upon the uterine muscular fibres, it could not but preserve the patient, at least, from the danger of a good deal of drainage, if not from a more violent and rapid effusion subsequently to the delivery. So confident am I in the power of the *ergot* administered in this way, that I venture to recommend it very strongly. Many persons, who were constitutionally prone to hemorrhage after delivery, have escaped well, from having taken the spurred rye, in the last moments of labour, in order to secure a tonic action of the uterus after delivery of the child.

I need not reiterate my opinion that the operator should not be unprovided with the forceps, with which to extract the head, in case of any uncommon or dangerous delay in its delivery, as I have already stated my opinion that such means of security ought to be held provided for every instance of breech labour, or preternatural presentation, of whatever species.

Fortunately, for us, we do not have to contend with a

great many cases of placenta prævia. I have seen four cases of these accidents, in which the orifice was completely covered by the afterbirth, and several others in which the edge of the placenta was located on the cervical portion of the womb, and occasioned a certain degree of hemorrhage, during the dilatation, but not to any dangerous or alarming degree.

Dr Collins, of Dublin, mentions, that eleven cases occurred during his mastership of the lying-in hospital, equal to one case in one thousand three hundred and ten labours, since he had fourteen thousand four hundred and fourteen labours during his mastership.

It is rather a surprising circumstance that Mauriceau, who was so largely engaged in midwifery practice, and who witnessed a good many cases of placenta prævia, should have been ignorant that the original attachment of the afterbirth was on the cervix. This distinguished writer always supposed, that when the placenta was before the child, it was owing to an accidental detachment of it from the fundus, in which it had fallen down to the orifice, so as to get in advance of the presenting part; and yet, he very distinctly gives directions how to pass the hand, so as in the easiest way to get it by the placenta, when the operation of turning has to be performed.

There is another kind of hemorrhage that is met with in parturient women; I mean the concealed hemorrhage. It may take place from the placental surface, and continue to a dangerous extent, without detaching the circumference of the afterbirth from its connexion with the womb. In this case, the whole placenta is separated from the womb, with exception of its rim; and the distensible material admits of so large a quantity of blood being effused, as to make it take the appearance of a bag filled with blood, and depressed into the uterine cavity. I have never met with a sample of this kind of bleeding; but the phenomena that accompany excessive loss of blood would give intimation, to an intelligent physician, in such a case, sufficiently clear to engage him to pro-

ceed aright in lessening the bleeding superficies, either by merely discharging the liquor amnii, or by turning, or delivering with the forceps. The symptoms, under such circumstances, would be weakness; dull pain in the womb; suddenly increased size and tension of the organ; frequency and smallness of the pulse; paleness; yawning and sighing; and syncope. The occurrence of such phenomena, in a pregnant woman, if alarmingly great, would be a full warrant for opening the ovum, or for an expeditious delivery; the latter, always, however, to be held in reserve until the womb is dilated or dilatable. The ergotic action might be, with great prospect of advantage, resorted to, in case the hemorrhagic symptoms should not abate upon the discharge of the liquor of the amnios.

The hemorrhages that take place between the delivery of the child, and the expulsion of the placenta, are frequently to be met with, and are so violent, as to excite great alarm in the patient herself, or her friends who happen to witness the distressing symptoms that accompany the accident. I think, that, in a very great majority of labours, the placenta is quite detached by the time the child's head has emerged from the vagina, and the separation frequently takes place still earlier.

In such women as have feeble pains, with long intervals, the effusion of blood is very great, and a large quantity frequently is found to be expelled immediately after the child is born. If this is a correct statement, then it may, *à fortiori*, happen, that the effusion may go on rapidly as soon as the body of the child has escaped. The womb, in many instances, is perfectly passive, for some time after the great effort it has made, and the placental superficies being exposed, a torrent of blood issues, which suddenly fills and distends the womb, and the woman faints and dies without any one perceiving that she has flooded at all. I believe that the blood would always flow out of the vagina, were it not that a firm clot occasionally happens to stop the os uteri, like a

tampon, so that none can escape; and if the womb be deprived of its irritability, its fibres will offer no resistance to the fluid which is poured into the cavity, and which, being sealed up by a coagulum, must distend more and more, and with a rapidity that augments as the placental surface grows larger and larger.

A careful practitioner ought not to allow such an event to take place, in his presence. He will frequently place his hand upon the hypogastrium of his patient, and ascertain whether the womb be properly contracted, and enforce its contraction, if necessary, by frictions, and by gently pressing the womb with his fingers applied to the lower part of the abdomen. The irritability of the organ is readily excited into effect by this means; and when the womb is properly condensed, there is little danger of any effusion taking place. It should be an invariable custom to place, after the child is born, the hand on the mother's abdomen, to make sure of the contraction of the uterus. This custom will give prompt information of the existence, or non existence, of a tonic contraction; and he who fails of attention to this point will, sooner or later, have reason to regret the neglect of so salutary a precaution.

But when flooding comes on, whether after delivery or antecedently to it, the same principle is applicable, viz. to empty the cavity as speedily as possible consistently with prudence. Let the placenta be taken away, and, after its removal, let pressure be made on the hypogastrium by the hand, or by a compress, and the pressure continued until the signs of hemorrhage have completely ceased.

It happens that the womb is incapable, sometimes, of separating the placenta wholly from its surface; but if it be half removed, there may flow a great quantity of blood, while the uterus continues unable to expel the afterbirth. The duty of the medical attendant here is to separate it entirely, by introducing his hand, and gently detaching it with his fingers, taking every possible care not to leave

any portion behind, which, by keeping up a continued irritation, would tend to maintain a hemorrhagic nismus, or even dispose the patient to metritis.

The greatest care should be taken in this case to keep the patient quiet, and strict order should be given not to lift her head from the pillows, until all the appearances of danger are gone. Any attempt to sit up in bed, or even to turn, for a woman excessively reduced by hemorrhage, is dangerous, since any muscular effort, by occasioning faintness or exhaustion, invites a renewal of the hemorrhage and debility, which are both to be deprecated.

I have met with several examples of the hour-glass contraction of the womb. This depends upon the contraction of the womb at the upper limit of its cervical portion, so that the afterbirth is contained, as it were, in a separate cell. The finger may pass up to the constricted point, and find the cord closely embraced by it. If no bleeding comes on, it is proper to wait an hour, to see whether the co-ordinate action of the muscular fibres will not overcome the horizontal constriction; but, if an hour elapses without the least change in the case, we have reason to infer that two, or even four hours, may not suffice to remove the difficulty, and we are always justified in taking away the secundines in that time, even should we not be prompted to do so earlier. It is, in general, not difficult to overcome the stricture, by introducing, first, the hand into the vagina, and then inserting one, then more fingers along side of the cord, until a sufficient portion of the hand is introduced to command the placenta.

The application of a compress, made by folding one or two napkins, and securing them upon the lower part of the abdomen by the common bandage, is a precaution that ought never to be overlooked where there is a great disposition to hemorrhage. Such a pressure not only prevents the womb from filling again, but it tends very successfully to secure a firm tonic contraction of the organ.

The *sacchar. saturni*, combined with opium, in doses of three or five grains of the former with from half a grain to a grain of the latter, repeated in an hour, offers

us a very useful resource in the styptic influence of the acetate of lead.

Infusion of red rose leaves, with elixir of vitriol; powders composed of five or ten grains of sulphate of alumine, with a few grains of nutmeg; and the application of cloths pressed out of cold vinegar and water to the pubes; all these are measures that must be sometimes resorted to, when the flow of blood continues, after the delivery of the secundines has taken place.

Violent and dangerous effusions of blood sometimes come on soon after the delivery of the placenta, and at a time when the labour is supposed to have been terminated in the most successful and fortunate manner. If half an hour elapses after the delivery of the afterbirth, without any flooding, we shall rarely meet with it, and may, for the most part, consider the patient safe. Nevertheless it does, sometimes, come on many hours later; or even many days are passed, without any apparent tendency to the accident, before the female is attacked.

The causes of this bleeding are to be sought for in the relaxed state of the womb, arising from loss of power in its muscular portion. They are almost invariably connected with an excited and impetuous circulation, by which the blood is propelled with such power and momentum into the uterine arteries, as to force their extremities, when they are not sufficiently supported and constricted by the muscular contractility of the uterus.

Such an attack ought to be foreseen, and obviated by the use of such measures as may serve to abate the violence of the blood's motion; and the patient ought not to be abandoned by the physician, until he has become fully satisfied that the danger is over. Let the patient lie in a horizontal posture; let blood be taken from the arm if required; let cool drinks be given, and cold water applied to the face and forehead; and let great care be taken to ascertain, from time to time, by the touch, externally, whether the womb is firmly condensed or not. It is not good, I think, to allow the napkins, that are often

applied to the vulva, to be too firmly pressed to the part ; they serve, when so pressed, as a sort of tampon, which enforces the coagulation of the blood in the vagina, and that itself is often a dangerous tampon. The blood which cannot escape accumulates in the womb, and brings on a concealed hemorrhage, that is likely to increase with a frightful rapidity that may sink the patient irrecoverably by the time it is discovered. When blood has once escaped from its vessels, it is of no further service in this case at least, and therefore the sooner it is got rid of, the better for the sufferer.

The bandage for the abdomen ought never to be omitted in these cases of flooding, for the belly being suddenly evacuated of the contents of the womb, there is produced a feeling of inanition and weakness, that often is, alone, able to bring on faintness, or a state approaching to it ; and that is highly conducive to the increase of uterine hemorrhage. I have already, in my remarks on labours, spoken on this topic, and will refer my readers to page 190 and 195 of this volume.

I have long been impressed with the beautiful simplicity and the truth of the following affecting story, from the pen of the celebrated Mauriceau ; and as his writings are little known in the United States, I have, on that account, as well as for the intrinsic practical importance of the case, resolved to translate it for this part of my work. Those who read it will, as I think, agree with me, that it conveys a most instructive lesson to the student of midwifery, and, if I am not mistaken, will need no other apology for its introduction here.

“ Many women (says Mauriceau, liv. 1, p. 158) have perished, together with their offspring, for want of prompt assistance on such occasions [hemorrhage] ; and not a few have escaped from an otherwise inevitable death by early succour ; while their children have received

the holy sacrament of baptism, of which, but for that aid, they would have been deprived. Guillemeau, in his *liv. 2, chap. 13, De l'Accouchement*, mentions six or seven cases confirmatory of this truth, in most of which it is seen that both the mothers and their children were the bloody victims of want of promptitude in delivery under such circumstances, while some of them escaped in consequence of early assistance: but, that I may confirm this doctrine by the results of my own experience, I shall relate one case, among many, that is very remarkable; and the remembrance of which is so vividly impressed upon me, that the very ink with which I now am writing, in order to make it known for the benefit of the public, seems to me to be turned into blood; for on that piteous and fatal occasion, I witnessed the effusion of a part of my own vital fluid, or, to speak more correctly, the whole of what resembled the blood of my own veins.

“ It was sixteen years ago that my sister, who was not yet quite twenty-one years of age, about eight months and a half gone with her fifth child, being at the time in excellent health, was so unfortunate as to hurt herself, though, to all appearance then, very slightly, by a fall on her knees, the belly at the time striking the ground; subsequent to which she passed a day or two without experiencing any considerable inconvenience, so that she neglected to keep herself as quiet as she ought to have done; but on the third day, at about eleven o'clock in the morning, she was suddenly seized with strong and frequent pains of the belly, which were also accompanied by a great discharge of blood from the vagina. She immediately sent for the midwife, who was not too well versed in her occupation, and who, when she arrived, informed my sister that it was necessary, before delivering her, to wait until the pains should spontaneously open the mouth of the womb, assuring her, that she had nothing to fear from the accident, and would be soon delivered, because the child presented very favourably. In this way she fed her with vain hopes for three or four hours, until, the flow of blood continuing very great, the pains began to leave her, and

the poor lady fainted away several times ; upon seeing which, the midwife requested that a surgeon might be sent for to assist her. They came immediately to my house, to notify me of the affair ; but being unhappily from home, they called in one, who, they supposed, was one of the ablest obstetricians or surgeons in the whole city at that period, and he was immediately taken to my sister's residence, where he arrived about four o'clock in the afternoon. Having seen the state she was in, he contented himself with merely saying that she was a *dead woman*, for whom nothing was wanting but the last sacraments of the church ; and that it was absolutely impossible to deliver her. To all this the midwife readily agreed, for she thought the opinion of this man, so universally esteemed, must be, beyond doubt, correct. As soon as he had pronounced his judgment, he went away, refusing to stay any longer ; and in this deplorable condition, and without offering the smallest succour, he left this female, whose life, as well as that of her child, he could have certainly saved, had he delivered her then, which he might easily have done, as will be seen by the sequel of this history.

“ After the judgment of a person of such great reputation, added to that of the midwife, every one who was present thought that since M. ——— could do nothing for her, there could be no other recourse, in so great a misfortune, than placing confidence in God, to whom alone every thing is possible.

“ They now endeavoured as well as they could, to console my poor sister, who with a passionate earnestness desired to see me, that she might know whether I also would pronounce the same judgment upon her ; and whether her disease, which was constantly growing worse, was beyond all remedy ; for her blood was steadily flowing in great abundance. At last, I returned to my house, where they had been a long time before, to tell me this bad news ; and where, most unfortunately, I was not to be found at the time, as I have already related. As soon as I heard of it, I hastened to her house, and upon arriving there, I saw so piteous a spectacle, that all the passions of my soul were agitated at the

sight, with many and different emotions : after which, having somewhat recovered my composure, I approached the bed of my sister, who had just received the last sacraments ; and being there, she implored me again and again to assist her, saying, that she had no hope but in me. After I had learned from the midwife all that had happened, and she had told me of the opinion of the surgeon, who had seen her more than two hours before, for it was now past six o'clock, I perceived that the blood still continued to flow profusely, and without ceasing, though she had already lost more than three parts, and, what is remarkable, more than forty-eight ounces within the two hours since the surgeon left her ; as I supposed from the quantity of the napkins and cloths which were all saturated with it ; which blood, by remaining in her body, had she been timeously delivered, would, beyond doubt, have saved her life. I also saw that she was seized almost every minute with sinking turns, that were increasing ; which convinced me that she was in far greater peril than she could have been had they not lost the opportunity of delivering her two or three hours sooner, which was both possible and of easy execution ; for at that time she had almost the whole of her strength, which she afterwards lost by the continual effusion of her blood. Wishing to know whether it was true that she could not be delivered, I found, upon examination per vaginam, the orifice of the womb dilated, so as easily to admit two or three fingers. Having remarked this, I made the midwife examine her again, in order to ascertain whether the os uteri had been in the same state when the surgeon stated that she could not be delivered ; and whether she was still of his opinion : she told me " Yes," and that the parts had remained unchanged ever since he had gone away. As soon as she made this declaration, I perceived her ignorance, and what had been the difficulty with the surgeon. Touching this, I told her of my astonishment that they had both been of such an opinion, as I was of a wholly different opinion ; for it would have been as easy for him to deliver her then, as now ; which, I should, in truth, have immediately done myself, could I possibly have

commanded my judgment, which was long vacillating upon the resolution, which, from the loss of all hope from other quarters, I was at last constrained to adopt. What hindered me was, not the prognostic of the surgeon, celebrated as he was, who had persuaded every body that to deliver her was impossible, (for it would seem like rashness to resist the dicta of those who are looked upon as oracles) nor the weakness of the patient; but it was chiefly the quality of the person, who was my own sister, and whom I tenderly loved, that agitated my mind with various passions. For, my mind was so preoccupied with seeing her ready to expire before my eyes, from the prodigious waste of that blood that sprung from the same source as my own, as to make it impossible for me to come to an immediate resolution and action. This obliged me to send incontinently for the surgeon, who had left her so long before, and beg him to return to her house, so that I might show him how easily she could be delivered, and by making him understand and confess that there is no hope on such occasions except in prompt delivery, induce him to operate, instead of leaving the mother, as he had done, to despair, and allowing her infant to perish without baptism, which it might have enjoyed had he obeyed the requirements of the art, which are, that if both can not be saved, we should, at least, try to save the child, if that be possible without doing any thing prejudicial to the mother. But he would not come back for all the prayers and solicitations that could be offered; and excused himself by saying, that it would be impossible to do any thing in such a situation. As soon as I learned all these things, I sent for another surgeon, with whom, had he come in time, I should have concluded in favour of the necessity of the operation, of the possibility of which I could have satisfied him; but, as misfortune would have it, he was absent from home. Meanwhile, at least an hour and a half more elapsed, during which the blood was incessantly flowing, and the faintness increased more and more. Finding myself, therefore, hopeless of the aid of the persons I had sent for, I resolved to deliver her myself immediately, for I had not been able to re-

solve upon it, except in this extreme necessity, for the reasons already given; which, indeed, was somewhat too late for the mother; for had I been able to command myself sufficiently to proceed to the delivery at my first arrival, there was great reason to hope for her safety, as it afterwards proved as to her child, when I had completed the task in the following manner.

“ I introduced two fingers into the orifice of the womb, which was open enough to receive them; I then gradually inserted a third, and little by little, the ends of all the fingers of my right hand, with which I so dilated the orifice as to admit the whole hand, which is readily to be done on such occasions, because, as has been already said, the abundant discharge of blood moistens and relaxes the entire womb very much. Having introduced my hand very gently, I found that the head of the child presented, and that the waters were not yet gone off, which obliged me to break the membranes with my finger nails. Having done this, I immediately turned the child so as to draw it down by the feet, which I easily effected, as I shall describe the operation in the 13th chapter of the second book. The operation was effected in less time than it takes to count a hundred, and I protest upon my conscience, that I never in my life performed an accouchement (of a preternatural case) with greater ease and expedition, or less pain to the mother, who never complained in the least during the operation, notwithstanding she then was quite herself, and knew perfectly well what I was doing. Indeed she found herself quite relieved, as soon as I had delivered her, whereupon the flow of blood began to cease.

“ As to the child, I delivered it alive, and it was instantly baptized by a priest who was in the chamber. The patient, and all the bystanders, who were numerous, then perceived very clearly that the surgeon and midwife, who had pronounced it impossible to deliver her, had done so without any good reason.

“ The operation was performed in good time to procure baptism for the child, who received it, praise be to God, as I just now said; but it was too late to save the life of its mother, who died an hour after its birth, in

consequence of having lost too great a quantity of blood, for she fell into a great swoon, like those she had had previously to the delivery. The flow of blood ceased, it is true, but there was not enough left in her body to resist these frequent syncope, which she could doubtless have done, had the surgeon who saw her first, delivered her three full hours earlier, as he could have done, without doubt, as easily as I did it; since which time she had lost, without exaggeration, more than eighty ounces of blood, twenty of which, had it been reserved, would have insured her escape; particularly, as she was a young woman, of a good constitution, free from all disease or inconvenience at the time she was attacked by this fatal accident, which happened, as before said, at eleven o'clock in the morning. She was delivered at seven in the evening; but the operation was unsuccessful for her, because she had been drained of blood: she died an hour afterwards, in full possession of her senses, and speaking until the last moment of her existence, which was at eight o'clock P. M."

Among the severe and dangerous disorders to which pregnant and parturient women are liable, may be classed the puerperal convulsion, as one of the most dreadful. It never occurs without carrying dismay among all those who take a near interest in the patient; and it exposes her to the greatest risk, by the violent affections of the brain with which it is connected.

I have already spoken, in a former page, of the excited state of the blood vessels that accompanies labour, and I think, that, in view of the rapidity and momentum of the circulation produced by the state of labour, no surprise ought to be felt at the occasional appearance of convulsions.

If the extreme violence with which the blood rushes along the arteries be taken into consideration, it will be seen that the brain must, in such an excited circulation, be brought into a state of the highest nervous activity, and the function of innervation so considerably augment-

ed, in consequence, that the muscles of the body fall readily into convulsive movements. The activity of the functions of the brain and spinal marrow is always increased, proportionally, with the quantity of blood circulating through those structures; a woman, therefore, in whom the pulse is uncommonly hard, frequent and large, ought, *cæteris paribus*, to be more obnoxious to the convulsion than a woman in a directly opposite state. Accordingly, I think it will be very rare to meet with the malady, except in such as have a very bounding and tense pulse. Let it be early obviated.

The long continued pressure of the womb upon the great vessels in the abdomen, cannot fail, in some women, to retard, to a certain extent, the flow of the blood in the branches of the aorta below the point compressed by the womb; and we daily witness the effect of that pressure on the veins and absorbents, in the temporary varices of the veins, and in the œdematous limbs, of the later stages of pregnancy; which symptoms are observed to vanish with the removal of the cause of pressure. This removal takes place by the birth of the child, and the subsidence of the womb into the excavation of the pelvis, after delivery. The same causes of pressure, by impeding, in any degree, the downward flow of the aortic blood, must give to the mass of blood a disposition to mount upwards, and linger in the vessels of the brain and upper parts of the body. They occasion a congestion and irritation of the brain, characterized by headache, confusion of thought, vertigo and delirium, resulting in convulsion or apoplexy. The merest tendency to such results is worthy of the most solicitous regard and anxious attention. Let a pregnant woman acquire the habit of congestion in the brain, and if, as soon as the efforts of labour come to superadd their power to a dangerous predisposition, we omit all regard and care for such symptoms, there will be more than a probability of our having to contend with the disorder now under consideration.

It is far better to ward off than to cure an attack of puerperal convulsion. No one can look upon the case, with due comprehension of its nature, and not fear that

a fatal effusion, or extravasation will take place during the attack. It is very well known, that not a few instances do occur wherein the fatal blow is struck at the very onset, and that some women never speak, and never show the smallest sign of reason or sensation from the moment of invasion, but sink at once into the stertorous apoplectic sleep, that leads rapidly to the sleep of death.

The state of pregnancy, for some women of a very irritable constitution, is rather a pathological than a physiological condition. The woman labours under constitutional irritation from the commencement of her pregnancy, and never feels well until she is delivered. She is fretful and peevish; ceases to be amiable; and after the conservative powers of the constitution are at last defeated and overthrown, the fruits of the disorder are seen in puerperal insanity, or convulsions. Such a state implies, and maintains a vitiated condition of the circulation, which should be met by venesections, repeated according to the enlightened judgment of the medical attendant, by purgatives or aperients; by counter-irritants; by a judiciously regulated diet; by regulated exercise; by proper clothing; and by the removal or prevention of all causes of mental solicitude or excitement. But in order to the suitable prescription of all these agents, the physician ought to see the patient occasionally, before the completion of her term. Hence, the public ought to know, that counsel should be taken of the physician, from time to time, for all pregnant females who do not enjoy good health during gestation. If such counsel were sought for at an early period, the attack of convulsion would not, in general, take place. Most of the cases come on when not in the least expected or anticipated, and, as I have already expressed it, "the fatal blow" is the first and the last one; the patient sinks at once into coma, and dies, without ever recovering her senses.

Under the dreadful circumstances of this disorder, one reflection ought to strike very obviously the mind of the medical attendant; it is, that if the woman were not pregnant she would not be assailed by the disease; and the inference very justly follows, viz., the pregnancy

ought to be terminated in order to put a stop to the malady. For whether the assault has depended remotely on mere pressure on the great vessels, or on that more metaphysical state called sympathy of the brain and womb, we shall enjoy a far better prospect of rescuing the woman if she can be delivered, than we shall if the womb remains unemptied.

But can we deliver? ought we to deliver? and how shall we deliver the woman? We can deliver if the womb is dilated or dilatable. We ought to deliver provided we find that the discordant operations of the womb are likely to fail of bringing the child into the world: for although the womb sometimes acts with great power during convulsion, and is successfully aided by the violent, irregular and spasmodic constriction of the abdominal muscles, and other accessories of parturition; it also happens, that the child, in some other instances, makes no progress at all, and the convulsions return at short intervals, affording but small prospects of escape for the patient, inasmuch as they will be likely to continue until the pregnancy is brought to a close by the delivery of the entire ovum.

It is, therefore, always desirable that the patient should enjoy the benefits of as early an accouchement as possible, but it must never be forgotten that the attempt to effect it must be regulated, entirely, by the fitness of the parts for the operation. There can be no excuse for forcing the hand into an undilatable os uteri, under any circumstances; and, if the medical attendant be ever so anxious to give his patient every possible chance of safety, he will not be excusable, if, on that account, he rather adds to, than diminishes the risks of her frightful disorder. It is true to say that "*anceps remedium melius quam nullum*;" but let not this trite aphorism lead us to the commission of positive mischief, under the impression that we are about to employ a *doubtful* remedy. Happily for us, however, delivery is not the only recourse to which we can apply in our anxious wish to put an end to the danger and distress of the scene before us. What are the circumstances of the case? The patient has, perhaps, complained of severe

pain in the head ; she is under the excitement of the fever ; she is heated ; the pulse is hard, full, and bounding, and greatly accelerated. On a sudden, the muscles of the whole body become convulsed, and the patient writhes, and every feature and every gesture are horribly distorted, the respiration is attended with a hissing noise, and froth issues from betwixt the teeth, which are firmly closed by spasm, giving rise to the peculiar hissing sound above mentioned. The eyes are rolled upwards, or moved in opposite directions ; and after a greater or less duration of the paroxysm, the patient sinks into a stertorous sleep, or profound coma, from which she is roused only by a renewal of the convulsive movements, or to mutter in the intervals, incoherent or inarticulate sounds. Here then we have the proofs, as they are the results, of a preternatural development of the innervating functions of the brain and spinal marrow, which are caused by, or maintained by, an undue momentum of the cerebral circulation. The remedy is, first, to remove the cause by delivery ; and second, to moderate the effect by venesection and evacuants. By the abstraction of blood, we can weaken the force of the whole circulation of the blood ; we can make the heart beat gently, and cause it to send the blood in a milder current into the vessels of the brain ; we can thus diminish the innervative function of that organ, and control the muscular excitement, while, at the same time, we abate the hazard of extravasations of blood taking place in the substance of the brain, or of the effusion of water into its ventricles. If there be a case of disease in which bold and daring employment of the lancet is demanded, it is the case of the puerperal convulsion. It is scarcely worth while, almost, to open a vessel to draw off eight or twelve ounces of blood. The patient ought to lose from thirty to sixty ounces at one venesection, if possible ; and if signs of faintness appear, they should be hailed as the harbingers of success. They will not appear, unless the brain is already, in some measure, freed from its state of tension ; unless the blood is no longer pushed upon it with such force as to excite it beyond measure ; and if

the mischief at the onset was not too great, there will be a greater chance of saving the patient provided they come on.

While we endeavour, by the use of the lancet, to diminish the momentum of the mass of the blood, which is propelled in vast quantities upon the brain, we ought not to omit the use of other available means of moderating the turgescence of the vessels of that important organ. The general bleeding should be followed, very soon, by the application of cups to the temples and back part of the neck, and the hair ought to be cut off, and shaved clean, so as to admit of the application of leeches to the scalp, and the subsequent use of ablutions of the head with iced water and vinegar; or the use of an epispastic, with which the cranium should be covered, if the coma and other symptoms of local disorder are not in a favourable train of abatement. Sinapisms ought to be freely applied to the lower extremities, and to the abdomen; and the location of them should be changed, from time to time, so as to keep up a constant irritation of some distant part, with a view of diverting the sanguine mass from the cerebrum. Enemata of salt and water, or of jalap mixed with water, may be made occasionally, as a further means of diversion to a safer part of the body. During the administration of so energetic an antiphlogistic treatment, it is in course to observe the most rigorous regimen: indeed, until the dangerous symptoms are gone off, very little aliment is admissible: solutions of gum, portions of barley or rice water, and where absolute weakness demands it, sago or arrowroot jellies, may be given occasionally, yet with great caution. Darkness, repose, silence, should all be considered essential prescriptions, in a case where so important an organ as the brain is concerned, and where the slightest irritations are sufficient to turn the scale in an unfavourable manner.

Long-continued ill health may be, in general, expected to follow severe attacks of puerperal convulsions; and nothing but the most constant care and watchfulness can avert many evil affections, the sequelæ of a state the most unnatural and trying to which the female constitution is obnoxious.

There are other circumstances that may suffice to convert a natural into a preternatural labour. Among these may be mentioned the prolapsion of the umbilical cord. The cord very rarely gets down below the presenting part of the child, and we have reason to be astonished at the rareness of the accident, when we consider the great length of that part of the secundines. The mere falling of the cord could not, under any circumstances, interfere with the ability of the woman to deliver herself, because it could not inconveniently occupy any space in the pelvis to the hindrance of the birth. The importance of the accident is relative only to the child, and not to the mother. The child is placed in imminent danger of dying by asphyxia, from pressure on its umbilical vein and arteries when they fall below its head, in labour. Hence, the necessity of expediting the delivery by manual or instrumental means, and the conversion of the natural into the preternatural kind of labour.

I do not wish to be understood as advising a resort to art as an invariable rule of practice in such cases ; for it fortunately happens, in some instances, that the pelvis is large and roomy, the os uteri dilates rapidly, and the pains are sufficiently strong to assure us that the child will be born so speedily by the unaided powers of nature, as to make it unnecessary for us to interfere. The child has so good a chance for escaping uninjured, in a rapid delivery, that it is more advisable to confide in that chance, than to expose the woman and the child both, to the hazards of a forced delivery. We also have the advantage of being able, by touching the prolapsed cord, to ascertain the state of the fœtus ; if the pulsations continue vigorous, we shall suppose the child to be doing well, and if they become faint and feeble, we shall be able to resort to the forceps or to turning, as the case may be. When the prolapsed cord has no pulsation, the child is dead, and of course, no steps need be taken

on account of the prolapsion, which, in that case, becomes a matter of indifference.

Many various methods of repositing the cord, or putting it back into the womb, above the fœtal head, have been proposed; they have mostly been found ineffectual, the cord being apt to fall down again, even after it had been put into the proper place. I have never yet had an opportunity to try a method which I beg leave to propose to my readers, and which is as follows. Take a piece of ribbon or tape, a quarter of an inch wide and four or five inches long. Half an inch from the end, fold the tape back, and sew the edges so as to make a small pocket. Then fold the other end in the opposite direction, and sew that also, to make a pocket of it. Now if the cord be taken in the tape, and held as in a sling, a catheter may be pushed into one of the pockets, and that one thrust into the other, so that we shall have the cord held as in a sling, which is itself attached to the end of the catheter. Let the catheter be now pushed up into the womb, beyond the fœtal head; it will carry the secured portion of cord with it, and the catheter being withdrawn, the tape is left in the uterine cavity, where no harm can be occasioned by its presence. If required, several such tapes could be secured round the cord, and all of them fixed on the end of the same catheter, and pushed at the same moment far up within the cavity of the womb.

Fainting or syncope, when often repeated in labour, is sometimes of so alarming a nature as to induce the practitioner to be willing to expedite the birth of the child, in order to put an end to so threatening a symptom. No prudent person, however, would be led to perform so serious an operation as turning, or the application of the forceps, without being first fully convinced of its necessity. Of the degree and imminency of the danger here, none but a medical person can be supposed a competent judge, and the case must be left in his hands, strengthened, as he should be, by the counsels of a professional

brother. I shall feel satisfied therefore to have merely referred to this cause, and to leave it to the discretion of the attendant physician, without any additional remarks.

A hernia, especially if of a kind liable to strangulation, might be a warrant for the accoucheur to hasten the moment of relief by the employment of the resources of art. We have also, in a few very rare instances, the dreadful accident of laceration of the womb, or vagina, to contend with. Of course, as soon as either of these accidents is known to exist, we should resolve to take the management of the delivery into our own hands, in order that we may, at least, save the infant, while we can also offer some faint chances of hope for the safety of the patient.

CHAPTER XVI.

OF THE FORCEPS.

IN modern times, the resources of the obstetric art have been signally augmented by the discovery, and the great perfection attained in the construction and use, of instruments for the forced delivery of the parturient woman. The ancients were not wanting in numerous inventions for expediting the birth of children, but, unhappily, all their instruments were created with the sole view and intention of being useful to the mother, and had no applicability to the child, except to extract it after depriving it of existence, or even to draw it forth from the womb still palpitating with life, and presenting the most shocking spectacle of mutilation and distress. The uncus, or crotchet, described by Celsus, continued indeed to be the model of obstetric instruments down to the close of the fifteenth century, when a happy thought resulted in the construction of an instrument most perfectly adapted to the security of both mother and child, and which, at the present day, and in the hands of skilful and well instructed persons, may be considered one of the greatest triumphs for suffering humanity.

Perhaps one of the ideas that would most readily and spontaneously present itself, in a case of difficult labour with a head presentation, would be, to take hold of the head and draw it forth; and I believe that most of the good women who so assiduously apply themselves to exhort us to help our patients, actually do believe

that we can take hold of the child's head with our fingers, and draw it into the world, as readily as we can draw a dollar out of our purse, or take an apple from a basket. But we cannot take hold of the head and pull it down, simply, because we cannot grasp an infant's head in the hand: we can apply our fingers to one side, and a thumb to the other side, and clasp it between them; but, when we attempt to pull the head down, we find that our fingers and thumb are not long enough to admit of our *grasping* it; and we withdraw the hand, leaving the head just where it was before we made the attempt, and the woman so much the worse for the additional irritation of her organs. This attempt must have been made many thousands of times, and always with the same unsuccessful result; and the idea of extracting it with a pincers or forceps sufficiently large to grasp the head, must also have presented itself for ages; but how to apply the forceps? A straight forceps could not grasp the head, it would slip off from the head as if it was wedge-shaped, while to make the forceps curved, so as to grasp the head, would make it impossible to introduce it, since the forceps must first enter into the genital fissure, and then expand sufficiently to pass over the parietal protuberances, so as to grasp the head when carried upwards far enough. Such, in fact, was the forceps of Palfyn, and such must have been the instrument spoken of by some Arabians. No forceps, that could be got on to the undelivered head, had been discovered; and in all cases, where the child could not be pushed back and turned, or where the head became permanently arrested, the medical people were obliged, either to let the mother and her offspring perish together, or they unscrupulously sacrificed the child, to insure the escape of its parent. Our ancestors consoled themselves with a quotation from Tertullian, to the following effect: "*atquin et in ipso adhuc utero, infans trucidatur necessaria crudelitate, quum in exitu obliquatus denegat partum, matricida qui moriturus.*" Barely to look over some of the plates representing the obstetric instruments employed previously to the discovery of the modern obstetric forceps, is sufficient to

produce a shudder, in any one familiar with the difficulties met with in parturition ; and the griffin's claws, sharp crotchets and tire-têtes, which were the boast of their inventors, in a barbarous age, serve but to set forth more signally, by comparison, the eminent usefulness of the modern instrument, to which we are indebted for our own escape from the necessity of employing such means as were very familiar and commonplace with our predecessors.

The great desideratum was a forceps that might seize the head, and extract it, without inflicting a wound ; and we are indebted for it to a Doctor Hugh Chamberlayne, who practised midwifery in England towards the close of the fifteenth century. He constructed, probably with his own hands, two curved pieces of iron, which, being introduced separately, were applied in succession to the left and right sides of the head, and then united by a pivot joint, by means of which the two separate pieces were converted into a pincers, or forceps, the handles of which crossed each other at the pivot or joint, and thus became capable of grasping and firmly holding the oval-shaped head of the child, while still contained in the womb or vagina. As the handles crossed each other, and were secured by the pivot, which passed through a drilled or mortised hole in the handles, it followed, that, when the extremities of the handles were pressed towards each other, the head was firmly grasped betwixt the blades or clams. The compressing force being duly applied, a sufficient degree of extracting power enabled the Doctor to draw the head forth from the passages, and the child was born without necessarily experiencing the smallest injury.

This great discovery, the essential value of which is known only to medical men, would have entitled its author to the everlasting gratitude of his fellow creatures, had he not tarnished his fame by shamefully making a secret of what ought to have been instantly promulgated for the general use of all who stood in need of its merciful intervention. But the spirit of the age, or a venal spirit of his own, induced him to confine his secret to his own breast, to be communicated, at length, to his two sons, who were

both instructed in the mode of its use, and are supposed to have drawn large profits from the necessities of the unfortunate women who, knowing their superior skill, were compelled to seek for safety at their hands.

Little is now known of these persons except their names ; and they have deservedly sunk into the oblivion which ought to overtake all those, who, whether by accident or by the possession of genius, come into the enjoyment of facilities which ought to be the common property of humanity, but who, instead of divulging them and spreading their use and employment as far as the want of them extends, are induced by a vile thirst for gold to retain them within their own hands, and sometimes permit their secret to perish with them, rather than give it all the publicity and currency which its importance entitles it to. Such is the spirit of quackery or empiricism, under whatever guise, or in whatever art ; and the fate of the Chamberlaynes, whose memory is almost forgotten already, is but a just retribution for their inhuman reservation of their valuable secret.

There is a very curious and interesting case related by Mauriceau, in which he informs us that Chamberlayne went to Paris in the year 1609, with a view to sell his secret to the government, and while there boasted, in the most confident manner, of his ability to deliver any woman, in any labour, no matter how difficult, in half a quarter of an hour. It happened, at this time, that a woman, with a deformed pelvis, fell into labour, and after vain attempts to deliver her, was put into Chamberlayne's hands. He undertook the management of the case with the utmost boldness, but, after a cruel perseverance of two hours, was compelled, through sheer fatigue and exhaustion, to give it over, confessing his inability to effect the delivery ; the poor woman perished shortly after his retreat, and her body being examined, it was found that he had lacerated the womb and vagina in various places, with the points of the forceps. Mauriceau was so disgusted with the issue of this affair, that he afterwards inveterately opposed the use of such instruments ; while Chamberlayne immediately returned to England

and drew very large receipts from the practice of midwifery in London.

In 1733, Dr Samuel Chapman published a *Treatise on the Art of Midwifery, &c.*, in which the forceps of the Chamberlaynes was given to the world, and, from that time to the present day, has undergone many modifications of form and size, and mode of coaptation; almost every distinguished practitioner, or writer, selecting some particular fashion as most in accordance with his especial views.

The instruments first employed, had only one curve, that which applied itself to the head of the child in order to grasp it; and this was called the Old Curve; so that the profile view of it represented a straight instrument. Such a straight instrument could be easily applied to the head whenever it had descended quite into the excavation, or whenever the ear could be touched by the point of one finger, introduced into the vagina. But in all cases, where the head was arrested while in the superior strait, a forceps possessing only the old, or original curve, could not well be employed in its extraction, because the pelvis is itself curved, and hence, when the points of the instrument had mounted up sufficiently far to be on a level with, or above the plane of the superior strait, the handles would necessarily press the edge of the perineum back too much towards the point of the coccyx. This pressure is both difficult and painful, and endangers an early contusion of the perineum or even its laceration.

Dr Smellie of London, and Dr Levret of Paris, both conceived at about the same time, about the year 1743, the idea of giving to the blades a new curve on the edges, so as to adapt them to the axis of the superior as well as to that of the superior strait; and accordingly they produced the forceps with New Curves, which are almost universally in use at the present day. Smellie used for common purposes his short straight forceps, fearing that too general and indiscriminate an employment of the long curved one might prove dangerous; while Levret recommended his long and powerful instrument as being equally adapted for all cases of proper forceps operations. Smellie's instrument was united by the reciprocal notch,

called the English joint or lock, and Levret's was joined by a pivot and mortice, with a sliding plate, to secure it when united; both the instruments were provided with fenestres, but of an insufficient size to do much more than serve to render them lighter.

The French forceps, somewhat modified by Pean, has great vogue in this country at the present time, under the denomination of the Baudelocque forceps. It is two inches longer than Levret's, and is constructed without the bead or raised line that runs round the inner or fœtal face of the clams, and which was found inconveniently to cut or contuse the scalp of the infant.

This instrument consists of two pieces or branches, a right and a left one, intended to be introduced separately between the sides of the head and the parts in which it is contained; but always so adjusted as to let the concave edge of the new curve look towards the front of the pelvis, to suit the curvature of which it was originally contrived or invented. The part that is called the blade or clam, ought always, if possible, to be applied on the side of the head, and not on the face or vertex, and the extremity of the clam should reach up at least as far as the chin. Hence, in constructing a forceps, it should be always considered necessary to make the clam, or blade part, sufficiently long to reach at least from the child's vertex to its chin; a distance of at least five inches in the uncompressed state of the head, but which is much increased in some cases where the head is subjected to severe and long continued compression in the passages. But while the head itself requires that the clams of the instrument should be five inches long, the different positions or situations in which the head is found at the time the forceps becomes necessary, demands that there should be given to the instrument length enough to embrace the head, whether it be high or low in the pelvis; and that in introducing them, the lock or joint should not be carried within the orifice of the vagina.

There must also be a handle of sufficient length and strength to admit of its being used with facility by the operator. The forceps therefore is divided into the blade or clams, the joint or lock, and the handles. The pro-

portion of these several parts has been adjusted in various ways, according to the taste or judgment of the several makers of them. Dr Smellie, who generally employed a short straight forceps, constructed them of the length of eleven inches, while to his long curved forceps he gave a length of twelve and a half inches.

The French or Baudelocque forceps, in very general use in this country, is a very powerful instrument. The specimen that I have before me, and which is made by Messrs Rorer, is exactly eighteen inches in length, the pivot or joint being very nearly midway from the end of the clams to the end of the handle. The ends of the clams approach within three quarters of an inch when the handles are closed or pressed together, while the greatest distance between the clams is not quite two inches and a half. The blade or clam has an open fenestre which is not quite an inch wide at its widest part, but which is six inches long, growing narrower as it approaches the lock, where it is not three-tenths of an inch in width. The lock or joint consists of a pivot in one branch, and a notch in the other. The pivot is fixed into its own blade by a screw, the top of which is a thumb piece, by means of which it may be screwed into or withdrawn from its place. The notch in the other blade is adjusted so as to receive the pivot into the left or outer side of the instrument, and the top of the notch, being counter-sunk, receives a shoulder at the bottom of the thumb piece of the screw, by which means it is made perfectly secure against any motion except that of opening and shutting the instrument. The end of each of the handles is curved outwards, so as to make a blunt hook, that may, upon occasion, serve all the purposes for which the blunt hook is used in midwifery. The weight of the specimen is two pounds and seven-eighths of an ounce.

This is a powerful instrument, which, in skilful hands, may be made use of to overcome very great obstacles; but which, in careless or unskilful application, may be the cause of great mischief. It has been objected to by many very prudent persons on account of the great weight of metal, and the severe pressure of the child's head, that

may, almost unconsciously by the operator, be made with it. The late Dr James very rarely used any other than a short-handled straight pair, called Haighton's forceps; yet I have had occasion to witness the application, by him, of a pair modelled upon the plan of the Baudelocque forceps. It cannot be doubted that all the benefits of the small forceps may be obtained in the use of the large ones; and those who cannot conveniently command a variety of instruments, would do well to familiarize themselves to that which I have above described.

The most convenient forceps that I have ever employed, and that which I commonly make use of, is the instrument recommended by Professor Davis, of the University of London.

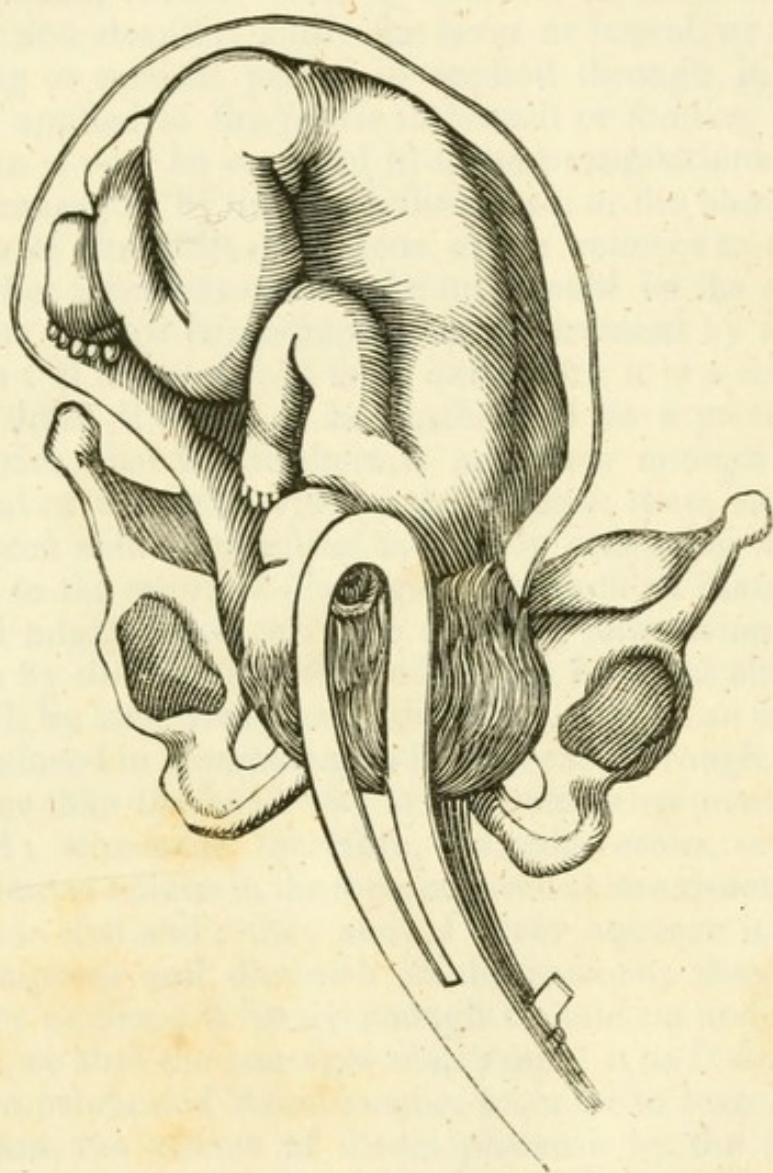
The instrument now before me is the one described in Davis's Operative Midwifery, and was made by Botschan of London. It weighs ten ounces and three quarters, and is in length twelve inches; its joint is the English joint, composed of a notch in the upper surface of the left and in the lower surface of the right branch. When the handles are closed, the ends of the clams are seven-tenths of an inch apart, while the fenestres, at their widest part, are two and three-quarter inches asunder. The widest part of the fenestre is equal to two inches, and its whole length five inches. From the extremities of the handles, to the lock, or point where the branches cross, is four and a quarter inches. After the branches are crossed they do not divaricate, but proceed in parallel lines one inch and a quarter: hence, if a foetal head be ever so considerably elongated by the pressure of the parts, the clams are sufficiently capacious to contain it. In this instrument, such is the width and length of the fenestræ, that a large part of the parietal protuberances jut out through them when they are fixed on the head. Indeed, the foetal head, when held within the grasp of this instrument, if it be properly adjusted, can hardly sustain any injury from it, so admirably is it modelled upon the curves of the part.

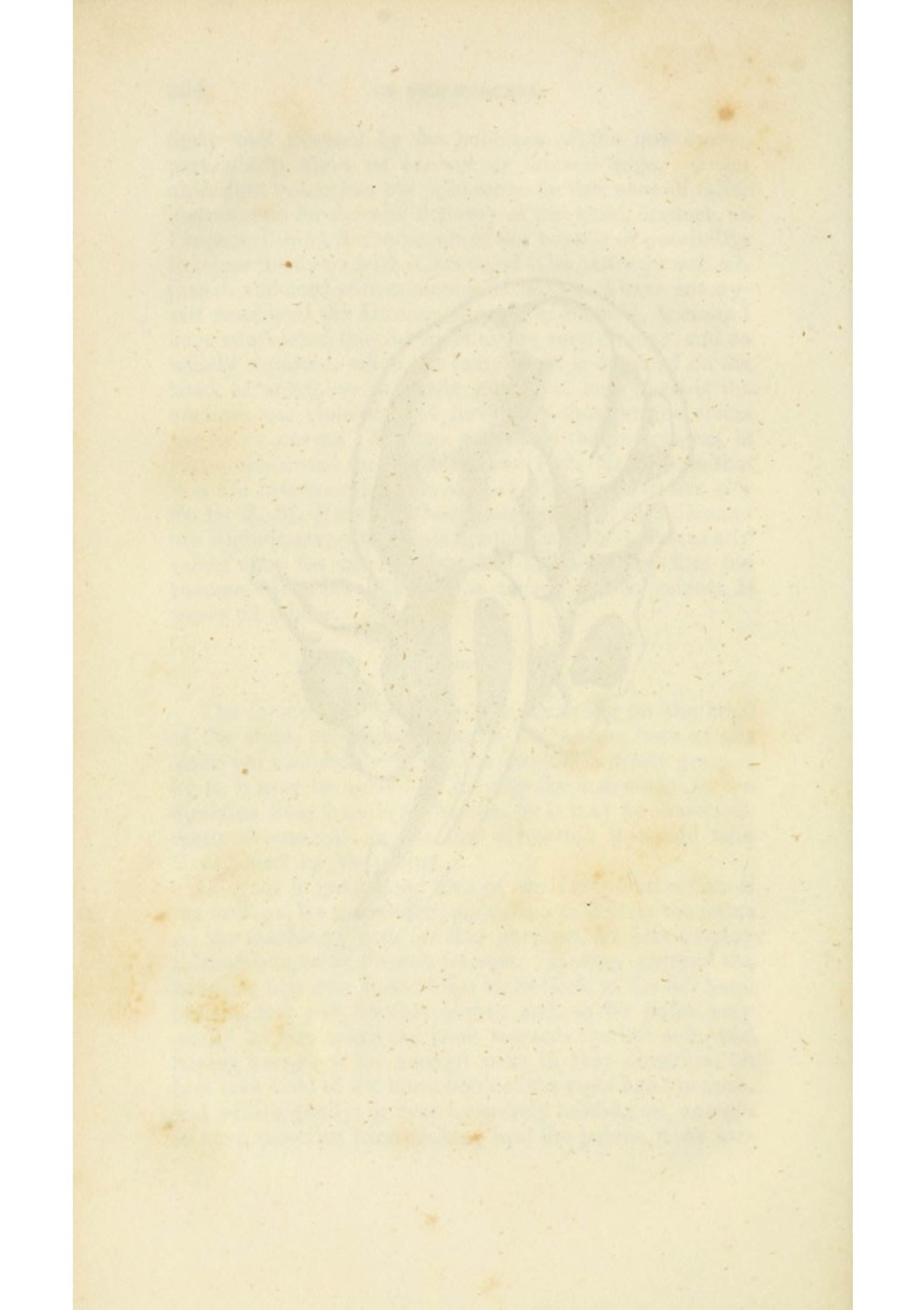
I have several times delivered from the superior strait with Davis's forceps, an operation for which it is pecu-

liarily well adapted by the boldness of the new curve, particularly upon its convex or inferior edge. I am quite free to confess my preference for this over all other instruments for the safe delivery of the child, because, as I repeat, I think it almost out of the bounds of possibility to injure the fœtus with it, provided it be perfectly well adjusted, and used with common discretion. I have not myself employed the German forceps of Siebold, because I have considered that the handles are very clumsy, and so widely separated, when the instrument is adjusted on the head, as to expose us to the hazard of compressing the cranium too violently. I have also thought the clams too much curved; but the author of the instrument is justly celebrated for his skill, and I am also aware that it is the instrument preferred and often used in our city by Dr R. M. Huston, whose judgment and skill demand my highest respect. This gentleman, who is frequently called upon for consultation, has informed me that his success with Siebold's forceps causes him to esteem it above all others.

The forceps is intended solely for acting on the head of the child, on which it exerts the power both of the lever and extractor. When the cranium is firmly grasped by it, it may be moved by moving the instrument in the direction from handle to handle, or it may be drawn directly downwards in the line of motion it would take if expelled by the pains.

In order to get a good idea of the lever-like action of the forceps, let the student endeavour to deliver the fœtus on the machine; and, for this purpose, let him employ a Baudelocque or French forceps. Having grasped the head, let him take hold of the blunt hook of the left hand branch, and pull by that alone; and, as he pulls, very gently let him move the hook towards the left side, and having carried it far enough over in that direction, let him take hold of the blunt hook of the right hand branch, and pulling gently, or even by merely holding on, enough to keep the clam from sinking into the pelvis, if he car-





ries the handle over to the right side, he will find what is meant by, and what is the great and efficacious power of the lever-like operation of the forceps, when moved, from handle to handle.

The compressive action of the instrument however is not needed, further than to cause it to hold the head firmly and steadily, while the lever or lateral, or the extracting or vertical power is applied through it. It is never applied to the pelvis in breech or footling cases; nor can it ever be required in those presentations which are manageable by the hand, the noose, or the blunt hook.

One of the most dangerous errors relative to the forceps that a student could take up, would be the opinion that the forceps is a compressive instrument by its very design: it is not so; it is an extractor; it is a *tire-tête*; and I think it ought to be established as a principle in obstetrics, that where there is not space enough for the descent of the head without the forceps, there cannot be produced a due proportion by merely squeezing the head down to the required dimensions by such an instrument. Lest I might, however, give a wrong impression of my views by the above, it is needful that I should state, that a head, by long pressure of the pains, may be so moulded and reduced in diameter as to be squeezed through a pelvis smaller than the head was at the commencement of the travail: whenever, therefore, the pains cease, or are insufficient to reduce it, the forceps, used as an extractor, may assist to that end; they should never squeeze it merely to compress and diminish its dimensions; they should always embrace it firmly enough to hold on and draw it down, so that the passages may mould it as it descends.

The celebrated Baudelocque, in order to learn, by inspection, the effects of direct pressure by the forceps, procured nine still-born children, and by moulding their heads in the hand restored them to the shape of the uncompressed head. He also procured three forceps of the very best quality, and as nearly alike as possible: he then applied the instruments over the parietal protuberances, and squeezed the head until the handles were brought into contact, and tied firmly with a string, so that the head might be accurately measured while under

the compression, and then compared with its dimensions before the instruments were applied. Such was the force employed in bringing the handles into contact, that the instruments, though very choice ones, were all spoiled by the experiment. The instrument was subsequently applied so as to embrace the forehead and occiput, and the results ascertained. These excellent experiments, for the particulars of which I must refer the student to *L'Art des Accouchemens, part 4, chap. 1*, are commented on by Baudelocque as follows:

“It may be concluded from these experiments: 1st, that the reduction in size of the fœtal head, included in the clams of the forceps, differs according to the different degrees of firmness of the cranium at birth, and to the more or less complete closure of the sutures and fontanelles; 2d, that this reduction cannot in any case be so considerable as has by accoucheurs been supposed, and that it can with difficulty, and very rarely, exceed four or five lines, with the instrument acting upon the sides of the head; 3d, that the degree of reduction should never be estimated from the distance remaining between the ends of the handles when they are pressed together in the act of delivering the head, nor from the amount of force employed to bring them towards each other; 4th, and lastly, that the diameters which cross the compressed one, far from increasing in proportion to the diminution of the compressed one, do not in general augment to the extent of a quarter of a line, and in fact are sometimes even lessened.”

The above mentioned results, procured by so distinguished a writer as Baudelocque, ought to suffice for removing any lingering disposition we might have to regard the forceps as a compressing instrument, and we should then be fully on our guard against the propensity to use it for such an object; but let it be considered that the head does not fill up the pelvis as a nail fills up the hole into which it is driven, but that it is always caught and arrested by two or perhaps four points on which it is impelled, and we shall see that if we do use it to squeeze, and reduce the size of the head, we shall only reduce those diameters that are already small enough,

and augment those that are already too large. The most proper view to take of the instrument is, that it is a substitute for proper labour pain, supplying the want of it when wholly absent, or aiding it when its force is insufficient to effect the delivery of the woman. Impossibilities are not to be expected from it; and in all those cases where it is inapplicable, we are compelled to resort to other measures of a far less pleasant character.

It is common to apply the forceps to the head after it has got fairly into the excavation, and the nearer the head is to the external organs, the more easily may the instrument be adjusted to it. Hence, whenever, in the management of a labour, we begin to perceive the signs that indicate the use of instruments, we often feel at liberty to wait until the presenting part can take an advantageous position, preferring to lose a little time, for the sake of acquiring a greater facility and assurance of safety. Whenever the head has sunk so low as to get the vertex just under or behind the sub-pubal ligament, we experience little difficulty in placing the two branches, successively introduced, into their proper positions, because the rotation is completed, and the bi-parietal diameter does not occupy the entire transverse dimension of the pelvis; but when we have to apply it before rotation has taken place, there is frequently great difficulty in getting either the first or the second branch directly over the side of the head, but if we fail to adjust the branches accurately in opposition, we either cannot make them lock, or we lock them in such a way that the edge of the instrument contuses or even cuts the part of the scalp or cheek on which it rests, leaving a scar, or actually breaking the tender bones of the cranium: in fact, the forceps is designed for the sides of the head; and if, under the stress of circumstances, we are compelled to fix them in any other position, we shall always feel reluctant to do so, and look forward with a painful anxiety to the birth, in order to learn whether

we have done the mischief we feared, but which we could not avoid.

I ought also to mention, that cases occur in which the forceps is clearly indicated, but in which we can by no means apply them; the size, and position of the head are such that we cannot by force or dexterity get the blade of the instrument betwixt the head and the bony passages; in such a case a proper skill and judgment ought to be employed, and then, when we cannot succeed, we must be content to think that we cannot, and that no one else can; and afterwards, we must resort to other means of relief. Further, we can sometimes adjust the forceps perfectly, but cannot effect the delivery, because the parts are too small. Here, also, we ought to suffer no feeling of mortification to vex us for want of success; we should feel assured that we have exerted a sufficient degree of strength and dexterity, a degree equal to what we ought to consider safe; and being then convinced or satisfied that our duty has been, in so far, done, we lay aside the forceps to resort to ulterior measures.

I have already said that the instrument is made for the head, to which alone it can be safely applied. It would crush or cut the breech, and the sides or the belly, if applied in breech presentations to those parts.

It cannot be applied unless the parts are favourably disposed; for instance, the os uteri must be dilated somewhat, and also dilatable. The vagina and perineum also must be in such a condition that we need have no fear of lacerating any of those parts, or the operation is contra-indicated.

The pains must have been proved insufficient for their office. We should find ourselves inexcusable, if we should be led to use them where the pains are still of vast force, and where they fail of success on account of a preternatural resistance. If we judge that the power of the pains is already as great as the patient ought to bear, we ought not to apply the forceps, in order to add to the forces, which are already perhaps, of a dangerous degree of intensity.

The motive for the use of the operation should be clearly understood, as referring both to the mother and

child ; to the mother alone ; or to the child alone. The consent of the responsible and interested persons should be obtained ; and, if time permits, some professional friend should be invited to witness and sanction the operation.

The position of the presentation should be well known ; and, if needful, by the introduction of the hand into the passage. The bladder and rectum should be evacuated, the former by an enema, and the latter by the catheter ; the last precaution ought never to be neglected.

The bed should be prepared by bringing the end or side of it quite to the end or side of the bedstead, and then covering it with blankets and sheets of sufficient thickness to prevent the bed from being soiled. Part of a sheet should reach down to the floor, on which some cloths ought to be placed, to receive the fluids that commonly escape during the process of delivery.

The patient ought to be brought to the side or end of the bed, as the case may be, lying on her back, with the end of the sacrum projecting far enough over the bed to admit of the most unrestrained access to the parts by the hand and the forceps. While lying in this manner the feet should rest on two chairs or on the laps of her assistants, sitting with their backs turned to the patient, and far enough from each other to allow the operator to stand between them.

The instruments, at all seasons of the year, should be placed in a bowl of tepid water ; and, when ready, they should be anointed with sweet oil, which adheres to them better than lard.

Lastly, the parts should be freely anointed with lard, the patient being always carefully protected from exposure by a sheet thrown over her.



The forceps are differently applied, according as the head is differently placed.

If the vertex present, and rotation have taken place so as to bring the point of the head just below or behind the sub-pubal ligament, the left hand blade is to be taken

in the left hand, and the fore and middle finger of the right hand should be passed upwards as far as conveniently can be done betwixt the left ischium and the child's head, somewhat towards the posterior part of the pelvis, or towards the left sacro-iliac junction. The branch should be so held as to cross the right groin, in a direction from above, downwards and inwards, so as to let the point of the blade be near the vulva, into which, it is, next, gently and slowly introduced, allowing the concavity of the old curve to be in contact with the convexity of the head. In proportion as it immerges, the point is directed upwards, towards the plane of the superior strait, the handle coming downwards as the introduction proceeds, and care being taken to direct the point by the two fingers as far as they can reach. If any obstruction or difficulty is met with, let it be overcome by gentleness and dexterity, and not by force. For example, if the point comes in contact with the ear, that organ might very easily be lacerated by any rude force, and a great deal of caution ought to be observed in order to protect the child from such a maiming, and the medical attendant from such a disgrace. At length the blade is introduced sufficiently far to show that the point is nearly even with the chin, and the old curve in contact with the side of the cranium and face, and that it covers the ear.

The end of the handle should now be depressed a little, and given in charge to one of the assistants, while the right hand branch is taken in the right hand, and the fore and middle fingers of the left hand are introduced into the vagina, as in the case just described. The branch is laid across the left groin, looking from above downwards and inwards, and the point of the blade is passed into the vagina above the first branch. This one should also be at first directed towards the sacro-iliac junction of the right side, and elevated as it proceeds so as to be brought at last into exact opposition to the left hand branch. If any difficulty occurs in getting it forwards enough, the two left hand fingers that are guiding it will serve to slide it edgeways into the proper position. The branches are now to be joined at the lock; and the union

of the branches is very easily to be effected if the opposition of the two counterparts is accurate. When locked, let the handles be brought near enough together to show that the head is firmly grasped, and then the instrument is to be withdrawn a little, in order to effect its complete adaptation to the convex surface which it holds or contains, within its jaws. If the handles come into contact with each other, the head is not held properly; if they gape wide apart, the clams are not upon the parietal protuberances: they ought to be about an inch apart.

Whenever, during the introduction, a pain comes on, the attempt should be suspended until the pain goes off, and then resumed, lest the os uteri might suffer a contusion or even a laceration by the iron.

The handles will point downwards towards the woman's feet, according to the degree of advance of the head, or they will point more upwards: their direction ought to be nearly parallel to the occipito-mental diameter of the infant's head; or the lines should divaricate not more than from five to ten degrees, according to the boldness of the new curves of the forceps employed in the operation.



The instrument is now adjusted; let care be taken that no external part be caught or pinched by the lock or joint. This is ascertained by passing the fingers round and within the orifice of the vulva. In general, no attempt to extract should be made until pain or tenesmus come on. When the woman is ready, therefore, let the handles be held in the left hand, while the middle finger of the right hand is placed in front of the joint or crossings, to assist in the extraction, while the index finger is to be pressed against the child's head, and *always* retained in contact therewith, during the extractive effort. The finger ought *always*, in this state, to reach the head; but if it leaves it, it is because the blades are slipping off, in which case traction should cease until they are adjusted again. While the finger remains in contact with the head, there is no slipping of the instrument.

The most successful mode of using the instrument at first, is to employ it as a lever, by moving it from handle to handle, exerting at the same time enough extractive force to prevent the opposite blade from plunging deeper into the parts, while we move the handles to the right, or to the left.

In exhibiting to my class a demonstration of the lever-like action of the forceps, after having adjusted the instruments on the head, in the phantome, I take hold of the blunt hook of the left hand branch, and leaving the other untouched, I draw that branch a little out, and at the same time carry it over towards the left thigh; in this action the blade of the right hand branch is found to be withdrawn considerably, bringing the head along with it. I next take hold of the blunt hook of the right branch, and drawing a little downwards, I carry it over towards the right thigh of the phantome, by which the blade of the left branch is withdrawn in like degree, bringing the head, which it grasps, along with it; so that by several successive movements of the sort the head is soon found to emerge completely from the vagina. One trial of this method on the phantome, will show the student how powerful is the action of the forceps used in this way.

In practice, all attempts at extraction ought to be made in conformity with the natural processes and dispositions or tendencies of the healthiest labour; there ought to be no hurry, no impatience, no temper exhibited by the operator.

In natural labour there are intervals of rest; in artificial labour there ought also to be good intervals of rest; which are required both for the physical relief, and the moral relief of the patient. Her mind is strained to the highest tension, by the mere thought that she is under the operation, and the tissues against which we are dragging the child, yield better, for a minute or two of rest, repeated from time to time, as the case admits or demands.

It should not be forgotten that the forceps embrace the head in a direction from the vertex to the chin; nor that, when the head is evolved under the stress of the instrument, it ought to undergo the same mutations as it would if expelled by the natural pains. Hence, as the

vertex emerges, and rises towards the front of the pubis, the ends of the handles rise along with it. In the last moments of the delivery of the head, during its *extension*, the inferior part of the occipital bone rests in contact with the mons veneris. If the forceps are still upon the head, in this situation, their handles will tend towards the abdomen of the mother, or they will at least acquire a perpendicular direction, if she lies on the back.

A goodly proportion of the examples of forceps operations met with here, are, as I think, rendered necessary by rigidity of the soft parts, to overcome which, the expulsive faculties have been exhausted by vain efforts. Let it be well borne in mind that the expulsive powers of the womb are enormously great, and that they sometimes fail of success because the vagina is not dilatable, or the perineum will not yield, or the labia will not suffer elongation, or all these obstacles may be in combined opposition to the delivery: remembering these things, we should not impatiently urge nature beyond her powers, lest we do injury where we are most solicitously endeavouring to do good. By rude and untemperizing exercise of strength, we incur very great hazard of rupturing these organs, and of bringing ourselves into some discredit, and of maiming the patient most injuriously. It is very true that the forceps acts as a dilator by separating the sides of the vagina and of the vulva before the advancing head; but, on this very account, and because it is so powerful a dilator, we are bound to exercise the greatest prudence in the use of it. I have, in many instances, refrained from the use of the forceps, in cases where they were, on other grounds, strongly indicated, because I could appreciate the impracticableness of any attempt suddenly to dilate the external organs, which I perceived to be far more frangible than dilatable.

It not unfrequently happens, that, in cases where the head has suffered a long arrest, and the natural powers have proved incompetent to its effectual advancement, the application of the forceps, and very moderate tractions with the instrument, will put it in rapid motion, so as to leave no doubt of its speedy expulsion under the

natural powers. In such cases I have been accustomed to remove the forceps, and allow the child to be born by the spontaneous exertions of the womb. I do this with the view of sparing pain to the mother, and under the conviction that the organs are less likely to suffer contusion, or laceration without, than with, the instrument. But it ought not to be done except under full conviction that the expulsive powers will be successful, since it is very mortifying to withdraw them unnecessarily, and be obliged to reapply them.

Inasmuch as we cannot exert any very considerable tractive force, without compressing the head with a severity proportioned to it, we should occasionally relax our hold on the handles, in order to let the blades cease from pressing the cranium. The effects of the pressure are rendered less dangerous for the child, by being occasionally intermitted. The same reasons are conclusive against the practice used by some persons, of tying the handles with a fillet, which makes it impossible to relax the grasp of the clamps, without the trouble of untying the fillet, every time such relaxation happens to be thought of.

Extreme caution is required for conducting the last stages of the operation with safety. The perineum should be well supported with a napkin held by the operator, or an assistant; and the delivery of the head should be deliberate and slow, and the patient exhorted to lie as still as possible. In delivering a lady rather advanced in life, of her first child, I was using a moderately strong traction while the head was passing out. On a sudden she threw up the pelvis, which changed the line of movement of the head, as I had the handles of the forceps pretty firmly grasped during the muscular efforts I was making; I could not let go soon enough to prevent the head from lacerating the perineum very severely. I felt then, and still do feel confident, that the perineum would not have been torn but for the very unexpected and violent movement of her pelvis. She recovered from the effects of the laceration in about three weeks.

As soon as the head is delivered, the forceps are to be

removed and handed to an assistant, while we take care to attend to the delivery of the shoulders, and finally, receive the child, which is to be done as in the most natural labour.

A more difficult operation than that just described is the application of the forceps where rotation of the head has not taken place.

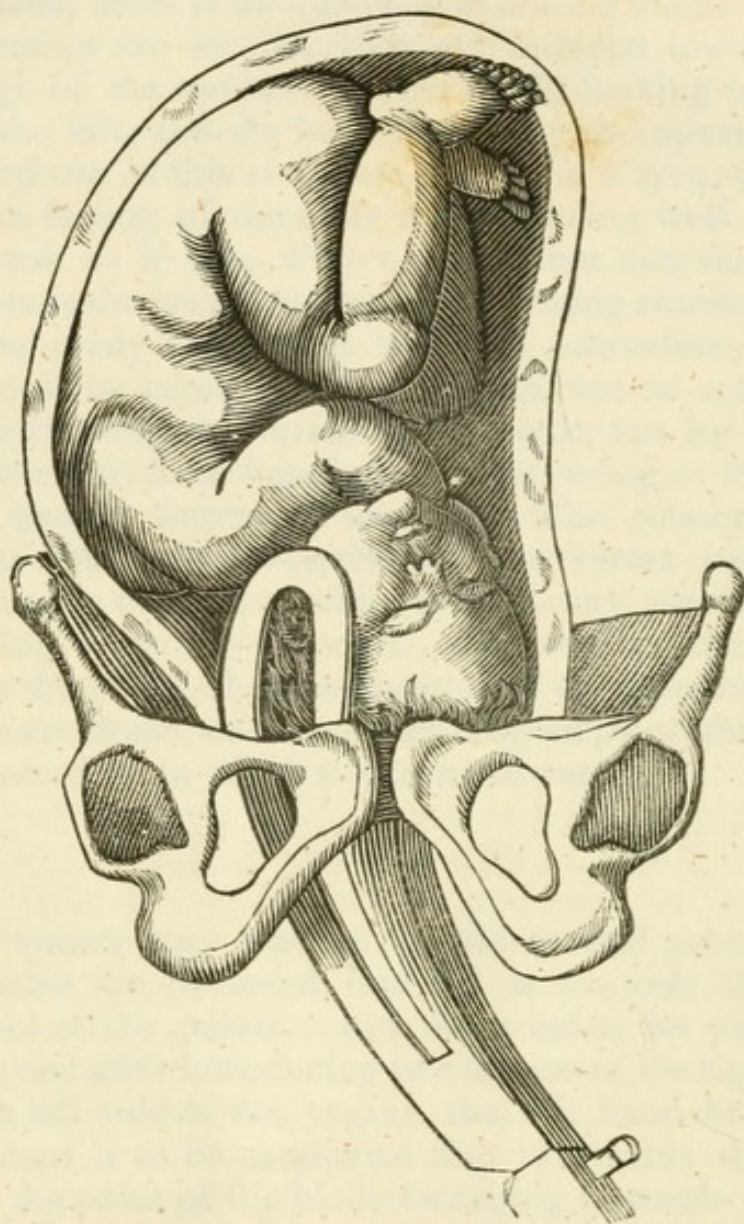
The first, and one of the most important steps here, is, to ascertain accurately, I say with absolute accuracy, the situation of the fœtal head. If the finger can reach the posterior fontanel, we ought to be able to appreciate, from that point, the relative situation of all the other parts of the head. If any doubt however remains upon the mind, after an attempt to discover the truth by the employment of the finger alone, the whole, or one half of the hand should be introduced into the vagina, so that by grasping the cranium with several fingers, we may become positively sure that our diagnosis of the position is correct. We will suppose the examination to have resulted in ascertaining that the vertex is in the first position, i. e. directed to the left-and-front side of the pelvis.

The patient is to be placed upon the back, as in the other case, and the left hand branch of the forceps, guided by two fingers of the right hand placed in the left posterior part of the vagina, is to be passed upwards in front of the left sacro-iliac symphysis. The end of the blade being conducted up to the child's chin, it will be found that the pivot of the blade will look upwards and to the left, and the handle will be inclined towards the left thigh of the patient. The blade being properly adjusted, an assistant should be put in charge of the instrument, while the right hand branch, guided by two fingers of the left hand, is next to be introduced into the right and lower part of the vagina, and gradually conducted forwards along the side of the head, to the right side of the chin, so as to cover the ear; the notch being just opposite to the pivot. If the blades should not be found opposite to each other, they will not lock; they must be

placed in opposition by bringing one of them more to the front of the pelvis, or pushing the other more towards the sacrum, and when they press upon the opposite sides of the head, there is no difficulty in uniting them. When the branches are locked, they are inclined towards the left thigh of the mother, the pivot still looking upwards and to the left, and the handles having an appearance of awkwardness in this situation, which, to a tyro, communicates a feeling of doubt as to their being well placed. They look as if they were crooked, but this very awkwardness is the best evidence of their being situated right.

When ready to proceed with the extraction, advantage should be taken of the first pain, not to rotate the head by twisting the vertex to the right, but by moving the instrument from handle to handle, using at the same time a proper degree of traction. The rotation takes place as the head advances, and the vertex very soon comes under the pubic arch, without any particular effort being made to rotate it. As soon as the vertex reaches the pubis, the peculiarities of this application of the forceps cease, and the remaining steps of the operation proceed as in the first described case.

The vertex may present in the second position; in which case the posterior fontanel is towards the right and front of the pelvis. Let the woman be placed as before; and after introducing two fingers of the right hand into the left side of the vagina, the left hand branch of the forceps is to be conducted into it towards the fourchette, the point of the blade sweeping upwards towards the child's chin, covering part of the ear, and coming off at the vertex. The handle will look towards the right thigh, and the pivot will point upwards, and towards the right. The handle of the forceps should be very much depressed in this case, because as the lock portion of the branch is inclined towards the right, it leaves scarcely space for the introduction of the female counterpart, which is to be introduced on that side; but a considerable depression of the handle affords a more



abundant space for that purpose. The branch, being correctly placed, is put in charge of an assistant, while the right hand blade, being guarded by the introduction of two fingers, is passed into the vulva at its lower or back part, and its point turned upwards and towards the left, as the handle sweeps downwards and towards the right. The joint is brought into apposition and locked.

As soon as a pain comes on, traction, combined with the lever-like action, must be instituted, and as the head descends, the mechanism of the pelvis compels the vertex to rotate towards the pubis, under the arch of which it soon begins to jut. This being effected, the peculiarities of the operation are removed, and its remaining conduct is to be fulfilled as before.

In those cases in which the vertex, instead of coming to the arch, rotates backwards and falls into the hollow of the sacrum, the forceps will be more likely to be required, because the difficulties of expulsion are greatly enhanced by the position. In this, as in all the occipito-anterior positions, the vertex must escape first; but in order to do so, it must glide down the sacrum and coccyx, and along the perineum, after having distended it enormously, until the fourchette slides backwards and upwards behind the occipital bone of the infant. In order to effect this, the occipito-mental diameter of the fœtus must become parallel with the axis of the inferior strait, or at least it must become nearly so. Such, however, is the exceedingly violent flexion required for that purpose, that much time is lost before it can be effected; and the woman is, in many of the instances, exhausted, and the pains gone, before it can be completed.

The position is ascertained by feeling the large fontanel behind the pubis, or just within the arch, while the sagittal suture runs backwards towards the sacrum.

When it is found that the forceps will be required to extract the head, let the male branch, held in the left hand, be introduced into the back part of the vagina, and conducted towards the chin as far as possible, carrying

the instrument up near the left sacro-iliac junction at first, and gradually bringing it forwards so as to apply it accurately to the side of the head. The oblique diameter of the head dips so much towards the sacrum, that it is impossible to embrace the head properly without depressing the handle very much, and thrusting the edge of the perineum very far back, which, though not a little painful, cannot be avoided. The instrument being held in this way by an assistant, leaves a sufficient space on the right side of the vagina for the introduction of the female branch, which being adjusted and locked in the male branch, leaves the handles very much depressed.

Having been well satisfied that none of the external parts are pinched at the lock, and that the head is firmly grasped, the first movement in extraction should be to raise the handles up a little, with a view to compel the chin to approach still nearer the breast, and in that way permit the vertex to glide down the sacrum and coccyx, assisting its descent by means of the lateral or lever action of the forceps.

As the perineum must, in this labour, be enormously distended, it behoves that great care and patience should be exercised, lest it might give way. It should be well supported, and as soon as the vertex clears the edge of the perineum, the handles ought no more to be raised, but on the contrary depressed, in order to let the head extend backwards—a movement exactly the reverse of what takes place in the occipito-anterior position. The head being delivered, the shoulders rotate in the excavation, and the right or the left one comes to the pubic arch, so that the rest of the process is concluded as in a first or second position.

The application of the forceps for the occipito-posterior positions, say the fourth or fifth, where rotation has not taken place, is more difficult than the one just above treated of. The blades are with much less facility applied, and indeed cannot take hold along the oblique diameter so completely as is to be desired; they rather

seize the head along its vertical diameter at first, and are gradually brought into parallelism with the oblique one, as extraction proceeds. Reflection upon this circumstance is very needful, at the time of the operation, lest the infant's head be, by want thereof, contused and even cut by the blades.

The introduction takes place as in a first or second position, the fourth corresponding to the first, and the fifth to the second. The handles must be well depressed in this case, and it will be allowable to make prudent efforts to rotate the vertex into the hollow of the sacrum—it being always understood, that in such labours, all hope of bringing it to the pubis, hath, after experiment, failed.



The head is sometimes situated transversely, the vertex resting against one, and the forehead against the other ischium. Let us suppose the vertex at the right ischium. It is intended to apply the male blade to the left side of the head, with the concave edge of the new curve looking towards the occiput.

Let the left hand branch be therefore introduced into the left and posterior part of the vagina, and as the point enters more and more, the handle should be depressed, until the curve applies itself on the left side of the head in a direction from the vertex to the chin, or as nearly so as may be practicable. It should be understood, however, that the blade will scarcely apply itself in that direction, because the chin is not so near to the breast as it ought to be. When the blade is adjusted, its pivot looks to the right, and lies in a horizontal position, while the handle juts out very obliquely towards the right thigh, which is much abducted.

As the left hand branch projects towards the right, there will be some difficulty in finding room for the introduction of the right hand branch; yet the other can be temporarily pushed out of the way, so as to let the point enter at the inferior and right side of the orifice of the vagina. When the curve is applied to the convexity

of the cranium, it must be pushed upwards, backwards and towards the left, so that its point may approach the chin, and the notch be brought in apposition with the pivot, and so locked. The head being firmly held, may be moved in the direction from handle to handle, and moderately rotated, so as to dislodge it; and the tractions being soon commenced, it is found to descend, the forceps rotating along with it, until the pivot turning to the left becomes vertical, and the fontanel appears at the arch.

Now it appears, that in all the operations I have described, the male or inferior blade is to be first introduced, without doing which, the female or upper blade cannot be introduced, without getting it below the inferior blade. There is one position of the head, however, in which it is proper to introduce the female blade first—and there is but one—which I shall proceed to treat of. The position to which I allude is that in which the vertex touches the left ischium, and the forehead the right ischium.

It is clear that when the instrument has grasped the head in this position, the handles will project very much towards the left thigh, in abduction; but if we introduce the male blade first, inasmuch as its handle will project towards the left thigh, it will occupy all the space on that side, and hinder or prevent the insertion of the second branch, for there is no place for the handle to be depressed in. To avoid this difficulty, therefore, take the female or upper blade in the right hand, and introduce it into the posterior and right side of the vagina, conducting its point as near as may be to the chin, and over the face to the right side of the head behind the pubis, leaving the handle to project towards the left thigh. Next take the male blade into the right hand, and turning the concave edge of the new curve downwards, insert the point into the right side of the vagina, below the female branch. Let the fetal face of the clam apply itself to the convexity of the head, and slide it onwards, and in proportion as it enters, make it sweep round the crown

of the head towards the back of the pelvis. In effecting this, the handle comes gradually down as the clam gets on the left side of the cranium, and at last the lock is found to be where it ought to be, viz. under the upper or female blade, with which it is then locked.

When we have ascertained that the head is properly held, or grasped, we may proceed as before, to move and to attempt to rotate it, and then deliver as soon as the vertex emerges from beneath the symphysis pubis.

Among sixteen thousand four hundred and fourteen women delivered at the Dublin hospital, under charge of Dr Collins, thirty-three had face presentations, and four of them had still born children, which is a little less than twelve per cent of mortality in this labour. I have said enough in my observations On Face Presentations, at page 201 *et seq.*, to make it unnecessary for me to repeat any thing here, in relation to the difficulties of that sort of birth. It is merely proper for me to remark that the forceps, when their use is indicated, must be applied to the sides of the head by carrying the points of the blades up to the vertex nearly. In those examples in which the chin comes to the pubis, the handles need not be very much depressed ; but in those in which the forehead is at the pubis, the handles must be at first very strongly depressed, and as the case proceeds, they must be strongly elevated, so as to get the chin down to the fourchette, over which it must slip, and then begin at once to approach the breast again, in the act of flexion. As soon as the chin is free, we allow the handles to descend again, while we continue the traction until the head is completely emerged. I shall take this opportunity for stating, that I conceive it to be impossible, to have a better instrument for this particular labour, than Davis's forceps, as made by Botschan, 35 Worship street, London. This instrument holds the head as in a basket, and is far less likely than any other with which I am acquainted, to bruise or in any way injure the child. The figures show very clearly the difference between a face case, in which the chin

comes to the pubis, and one in which the forehead is there, as well as the manner in which the head is taken hold of by the forceps.

The head is said to be *locked*, whenever two opposite sides of it are caught by two opposite sides of the pelvis, and held so firmly there, that it can descend no lower, and either cannot, or cannot without great difficulty, be pushed upwards again into a freer or larger space. In general, when the head is thus locked, it is in its transverse or bi-parietal diameter, one parietal protuberance being held at the pubis, and the other at the projection of the sacrum. Supposing the pelvis to be only three and a half inches in its antero-posterior diameter, and the head to be three and three quarters in its smallest diameter, then it might happen, as it does in fact happen, that the cone of the head should be driven by the force of the pains, long continued, into the narrow pass, the delicate bones of the head giving way, and becoming indented under the pressure of the promontory of the sacrum, and moving downwards until it becomes immovably fixed and held fast by the opposing points of the pubis. This state would constitute what is called a locked head. Many evils result from this locking of the head. For example, the woman, after vain efforts, and very great suffering, becomes feverish, and at length loses her pains altogether, or a state of constitutional irritation comes on, marked by a frequent, small pulse, coolness of the extremities, sunken or cadaverous appearance of the face, jactitation, vomiting, and if not soon relieved, followed by death, which hastens at rapid strides to end the strife. The pressure destroys the child; it also produces the death of the parts of the mother that are compressed betwixt the pubal or sacral bones and the child's cranium; or it causes inflammation to take place, to be succeeded by sloughing and its consequences. Or, the urethra being effectually compressed betwixt the cranium of the fœtus and the symphysis pubis, a total suppression of urine takes place, followed by its very serious consequences; or lastly, the soft parts, perhaps the vagina, or possibly the womb, being pinched as above stated, may give way during a pain, and the

laceration, once begun, may extend so far as to allow the child to escape into the peritoneal sac.

Whenever, then, the head is found to be so situated that it will neither advance nor retreat, it may be said to be locked, and the case ought to command the greatest care from the medical attendant.

It is manifest, that if the arresting points of the pelvis touch the head at its parietal protuberances, no possibility exists of applying the forceps in that direction; there is not space enough to admit of the blades, and if they are to be applied to the head, it can only be on those parts that are free from great pressure, as the face, upon one side, and the occiput, on the other; and this must be done notwithstanding any fear we entertain of contusions upon the face, of which there is some risk, but which very risk becomes less as it is the more constantly borne in mind.

When the attempt to deliver in this case is about to be begun, the forceps should be well pressed together, so that when the lever-like movement takes place, their blades may not be allowed to slip or slide upon the face, which would thereby be very liable to excoriation, or even to be cut by their edges, formed, as is well known, for application to a convexity different from that of the face. The motion from handle to handle, assisted by a sufficiently powerful traction, will, ordinarily, succeed in disengaging the head, and getting it down into the excavation; upon which, the blades ought to be removed, and, if the pains are revived and prove strong enough—they need not to be re-applied; but, in the lack of a proper force, they should be adjusted anew, and on the sides of the head, which is the part for which their curves were fashioned, and to which only they are really adapted.

In making compression, let it be carefully remembered that that compression is not designed for the purpose of diminishing the diameters, but only to hold the object more securely or steadily; any amount of compressive action beyond this indispensable one, is mischievous, as tending to augment the difficulty, by forcing the parietal protuberances more decidedly against the arresting points.

I succeeded by this means in drawing a head through a pelvis so faulty in its antero-posterior diameter, that I could readily touch the sacrum, by introducing only the forefinger into the vagina. The patient was a very small woman of colour, to whom I was called, in consultation by a young medical friend; the child was dead, but not injured by the instrument. So great was the difficulty, that I at one period, entertained very seriously the idea of performing the embryulcia. In these cases, the operator, who alone can estimate the degree of force he employs, is the sole judge, as to whether that force is too great to be compatible with the safety of the woman: should he, upon a due consideration of it, deem it wholly unsafe to proceed, or impracticable to succeed by any legitimate exertion of his strength, there remains the resource, sad as it is, of the perforator. Now that we have the advantage of the stethoscope, we can, with great certainty, determine the question of the life or death of the fœtus in utero; and where we find, upon auscultation, that its life is extinct, we need have but little hesitation in applying the perforator, in order to reduce the size of the skull, by extracting its contents. In doing this, however unpleasant the operation, we effectually remove all danger arising from a further continuance of the pressure on the soft parts of the mother. In case the stethoscope reveals the fact, that the fœtus is still living, we should feel constrained to wait so long, as to overstep, perhaps, the boundaries of prudence.

But it does not always happen that the head is locked in the direction and situation above pointed out. The vertex may be jammed down behind the pubis, and the forehead in front of the promontory. Here the forceps can be legitimately adjusted, and admit of the application of a greater force, and it will be probably found less difficult to unlock and rotate the head, in consequence of the greater convexity of the points of arrest. Some degree of rotation ought to be given to the head by means of the forceps until they succeed in getting it down into the excavation, when it may be rotated back again to the arch of the pubis, and so withdrawn.

Impaction of the head cannot take place at the superior strait; the shape of that opening is such that its whole circumference cannot be filled by the head of a child; there would always be found a part of it in which not only the blade of a forceps, but a couple of fingers would find passage; but after the head has sunk below the strait; the conical figure of the excavation, perhaps admits of its whole circumference being occupied by the head, which fills it up completely, and so completely, that the forceps can find no space in which to pass. Let the attempt, however, be made, in every unavoidable case, and when it fails of success, the head can be opened, and the skull made to collapse.

It only remains for me to relate the manner of applying the forceps in breech or footling cases, wherein the head refuses to come away after the shoulders are delivered. I have already said, that it is my invariable rule, to have the forceps in readiness in every instance in which I discover that the head is to be the part last born.

When the instrument is wanted for such a use, it is wanted suddenly—immediately; and the medical attendant fails in his duty, who finds himself in want of forceps for this purpose, and is obliged to send for them; for a child perishes, while a messenger is going a hundred yards, or putting on his boots.

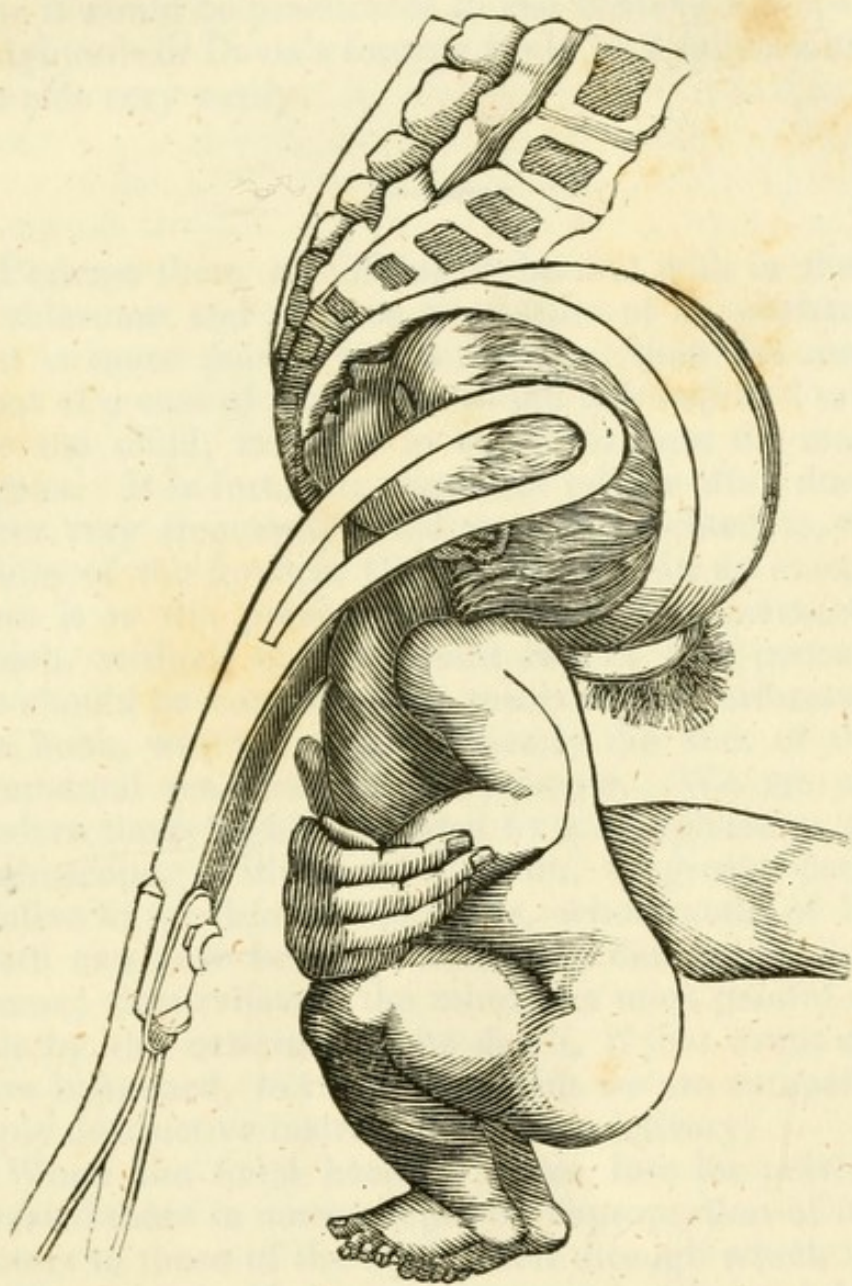
There is no need for my going again at length, over the causes that render the forceps necessary on these occasions. It is enough, that the expulsive powers are wanting, either from disproportion, from cessation of efforts both voluntary and involuntary, or from mal-position. If the head continues undelivered but a few minutes, the child is lost.

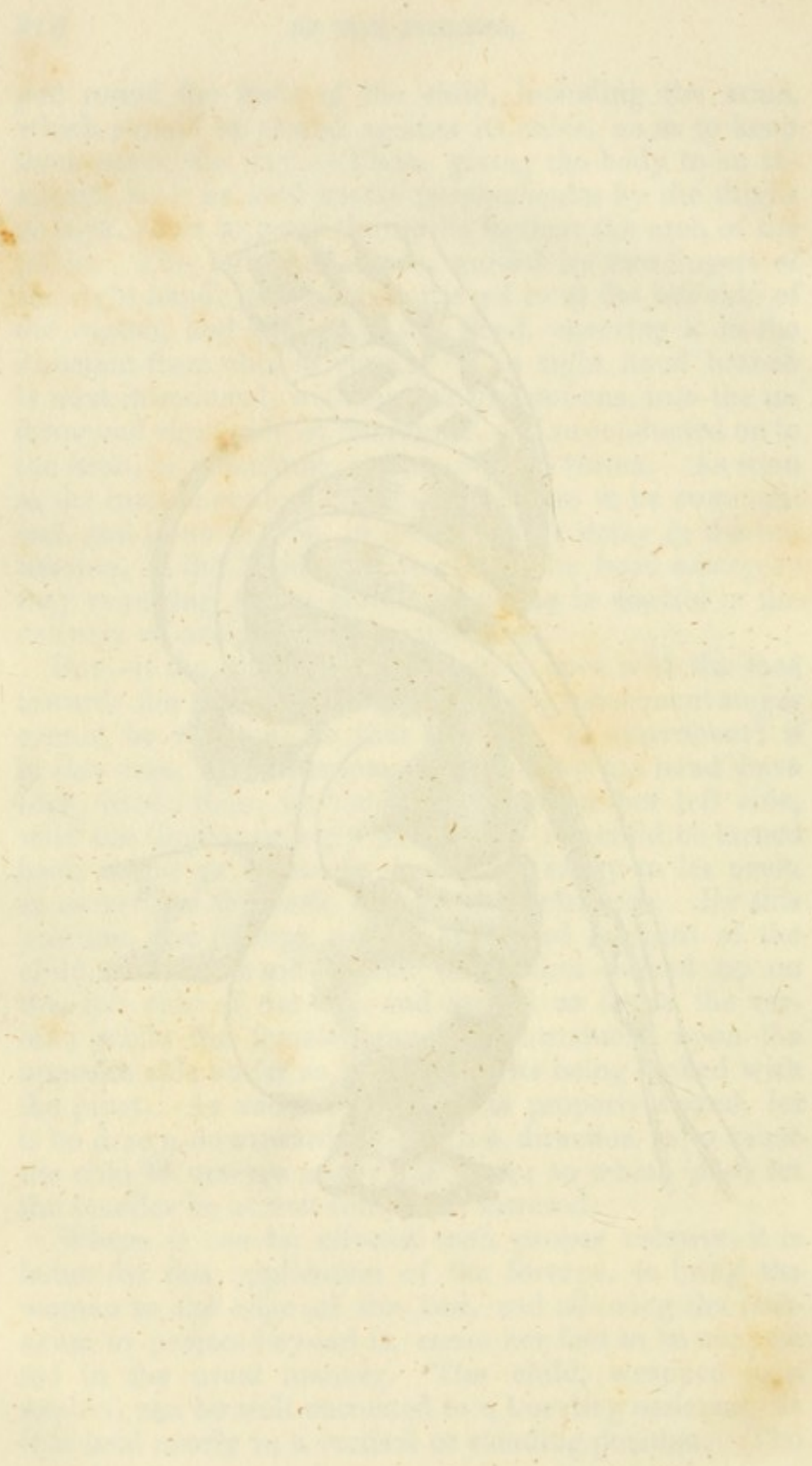
Supposing that the shoulders are delivered, and the face in the hollow of the sacrum; let a napkin be wrap-

ped round the body of the child, including the arms, which should be placed against its sides, so as to keep them out of the way.—Then, giving the body to an assistant, let it be held nearly perpendicular by the thighs or hips, so as to press the nucha against the arch of the pubis. The left hand blade, guided by two fingers of the right hand, is to be then passed in at the left side of the vagina, and applied to the head, covering it in the direction from chin to vertex. The right hand branch is next introduced, with similar precautions, into the inferior and right side of the vagina, and so conducted on to the head, as to embrace it from chin to vertex. As soon as the instrument locks, the tractions are to be commenced, and there will be, in general, little delay in the extraction, if the handles be raised as the head emerges; they requiring to be elevated, just as is needful in the delivery of occipito-anterior positions.

But—if the child be unfortunately born with the toes towards the pubis, and rotation in the subsequent stages cannot be effected, so that the face is uppermost; if in this case, vain attempts to deliver by the hand have been tried; then, let the woman lie on her left side, with the thighs strongly flexed; let the child be turned back as far as it can be done with safety to its neck, so as to bend the neck very much backwards. By this position, the forceps can be introduced in front of the child, the left hand branch being first passed up on the left side of the chin and carried as far as the vertex; while the female branch is introduced upon the opposite side so far as to allow of its being locked with the pivot. As soon as the head is properly seized, let it be drawn downwards in such a direction as to cause the chin to emerge under the arch; to which end, let the handles be at first somewhat lowered.

Where it can be effected with proper celerity, it is better for this application of the forceps, to bring the woman to the edge of the bed, and allowing the perineum to project beyond it, cause her feet to be supported in the usual manner. The child, wrapped in a napkin, can be well entrusted to a kneeling assistant, as it is held nearly in a vertical or standing position. The





branches of the instrument have, by this means, free access to the left and right sides of the vagina, and they lock with the greatest ease in front of the throat. Except in such a position of the woman, I cannot conceive how it would be practicable to use the long forceps; but Haighton's or Davis's forceps could be applied while on the side very easily.

Perhaps there is nothing to be met with in the very troublesome and anxious profession of an obstetrician, that is more painful to his feelings, than the management of a case of labour, in which it is required to mutilate the child, in order to extract it from the maternal organs. It is fortunate that this odious duty does not occur very frequently; and we are indebted to the inventor of the forceps, Chamberlayne, for an exemption from it in the present age, in numerous instances, in which, without the important uses of that instrument, we should be compelled to resort to the perforator and the hook, which comprised nearly the sum of the instrumental resources of the ancients. We are also in modern times highly favoured by the application of the stethoscope, or direct auscultation, for greater certainty relative to the life of the foetus, whose state of life or death can now be very accurately determined by that means; thus relieving the mind of a most painful solicitude by the certainty of its death, if that event should have happened, in cases in which we are compelled to apply destructive instruments for its delivery.

When the foetal head is driven into the pelvis, and arrested there in consequence of disproportion of its diameters to those of the bony canal through which it is to be transmitted; if the arrest cannot be obviated by the hand, the lever or the forceps, there is danger that the mother may suffer so much constitutional irritation from the fruitless efforts she makes, and the agonizing pain she endures, as to sink into exhaustion, and perish with the child still undelivered. But even in those instances in which she is not threatened with exhaustion, she is

liable, from the pressure of the head, to have inflammation or gangrene of the soft parts, which are contused by it, or she is exposed to the danger of lacerations of the womb itself, or of the vagina, whose consequences are greatly to be feared and deprecated.

Exhaustion, manifested by cessation of the pains, smallness and great frequency of the pulse, a haggard and sunken countenance, anxiety, jactitation, coldness of the extremities, profuse viscid sweats, and delirium—all these may come on, in labours that are drawn out too long from smallness of the pelvis, and from rigidity of the soft parts; cases in which we may discern, very clearly, the necessity of immediate delivery, to rescue the woman from impending death. When such signs are present, and the child is known to be dead, if the ergot and the forceps are found, upon trial, to be unavailing, recourse must be had to the most speedy means of relief, to wit, the opening of the head, and discharge of its contents, with a view to the collapse of the cranium. This object is effected by the introduction into one of the fontanelles or sutures, of the perforator, commonly called Smellie's scissors, the blades of which being opened, make a free incision, through which, if enlarged by a crucial cut, the cerebral contents are either extracted at once, or allowed to escape slowly under the pressure of the pains. As soon as the opening is made, it is common to push the perforator deep into the cavity of the cranium, or to introduce a crotchet so as to break up the textures within, and then, seizing the head by means of the sharp hook, which is applied to any convenient situation on the outside or in the inside of the skull, to drag it through the vulva, and deliver it; after which, if the woman have not suffered too severely, she soon recovers of the effects of her preceding fatigue, and severe pains.

This is the simplest and easiest case of embryulcia, and is one that any humane practitioner would, or might perform, without hesitation, upon the proper grounds for the proceeding being fully set forth to him.

Yet, notwithstanding the facility with which the operation of embryulcia may be performed, it is one so unnatu-

ral, and so shocking to the feelings of all concerned, that it ought not to be performed without very satisfactory reasons for it; and in general, not without consultation and agreement with a medical brother. In those instances in which it becomes necessary, during the life of the child, to resort to this mode of delivery, the most formal consultation ought to be regarded as indispensable; and no such consultation can be supposed to result in such a proceeding, except upon the most urgent and clearly understood reasons for it.

There are cases of labour occurring in women with deformed pelvis, that are plainly impracticable with an unmutilated child. For example, if a woman have the pelvis occupied with an exostosis, or if the diameters of that canal are changed and spoiled by rachitis or by malacosteon, the child contained within her womb cannot escape whole *per vias naturales*. If the promontory of the sacrum comes within two inches and a half of the symphysis pubis, the child cannot pass the strait, because its smallest diameter is three and a half inches; and indeed, if the pelvis have three inches of antero-posterior diameter, it cannot be born, unless it be uncommonly small; and moreover possessing a very incomplete ossification of the cranial bones, and great laxity of the suture lines that unite them: such a head might, by long pressure under a very powerful womb, be at length forced down through the strait, after it has been moulded into the proper form by the force applied to it. Yet, when we come to consider, that the bi-parietal diameter is three and a half inches, we shall entertain little hope of getting the head down, in a pelvis of three inches. It is very true, that Solayres, and Duges, and others, have been fortunate enough to meet with cases in which the head, at term, has been born in a pelvis of two and a half inches from front to rear; but it is not to be expected that success can attend labour in a female whose pelvic deformity even approaches to two inches and a half in its smallest line of diameter. The exceptions but prove the general rule.

Such a pelvis is not fit for the forceps; since it is too small for them to be withdrawn when locked. The ques-

tion must always be, therefore, between the perforator and crotchet on the one hand, and the Cesarean section on the other. But this is only to be considered as relative to the living child. Of the dead child, no question can arise, as to the mode of its delivery, except that of the perforator, and whether sooner or later. The dead child must always be withdrawn *per vias naturales*, if there be space enough to extract it through. But even where the child is known to be dead, we may be compelled to perform the Cesarean operation, if we would deliver the woman at all, since deformity may reach to the degree of shutting up the passage, even against the perforator. There is in the University of Pennsylvania, a pelvis so distorted, that the hand could not possibly have directed an instrument to the head, in a manner to enable the surgeon to open and extract it. The woman from whose remains the pelvis was taken, died in the Almshouse, resolutely rejecting the Cesarean operation, and preferring to it, the death which she knew to be inevitable.

The practitioner who may be in charge of a case of labour where *embryulcia* is indicated, must be guided by his judgment, and the counsel of his medical brother, as to the signs which compel him to undertake the delivery. I have already enumerated them—and they are easy to be understood. There is, in general, far more danger of the operation being deferred too long, than of its being performed too soon, since, if it be not performed in time to save the life of the mother, it would be as well not to do it at all. I know, that in uttering this sentiment, I am liable to the imputation of wantonly encouraging the use of this dreadful operation, but I wish to disclaim such an intention. I hope that no man living is more reluctant than I am to use any obstetric instrument whatever; and I fear that the resort to their employment is often had, very unnecessarily and rashly. But, I consider, that when the case under consideration arises, we ought to act so promptly and so understandingly, that we may, on the one hand, derive a perfect success from it, and on the other, stand acquitted, in our own judgment, and in that of others, from the charge of any rash-

ness or precipitation. I shall strive, therefore, while I reiterate the opinion, to clear myself by repeating, that all such cases require a medical consultation. To mutilate the child, and then lose the mother, is a real misfortune, both for the practitioner himself and for the profession, which is by such results in danger of falling into disrepute.

It is to be understood, then, that where all other instrumental means fail—where, after due reflection upon the circumstances that hinder the delivery, a conclusion is formed that the mother and child must both perish, unless the latter be withdrawn by the assistance of instruments that mutilate it—where the Cesarean operation is inadmissible, or rejected by the patient, we have the remaining, and very sure resource of the operation of embryulcia, or embryotomy; and we can venture to encourage and cheer the unhappy and suffering female, with the prospect of speedy relief by its means.

I have had occasion to feel, in common with other practitioners, how dangerous an instrument is the sharp crotchet. The force to be employed on it, in extraction, is so great, that should the point slip from, or tear out of the bone, it is always jerked downwards several inches, and is very apt to catch in some of the soft parts of the mother, which are ploughed up and lacerated by it. How easy it would be to lacerate the vagina, or even the lower part of the womb, by the slipping of the point; and nevertheless, he who uses the crotchet, and is perfectly aware of the risk, is under the necessity of running that risk whenever he takes the instrument in his hand to deliver with it. There is no part of the cranium to which it can be applied, without some hazard of its losing its hold. This is most apt to occur from the faulty manner in which the crotchet is generally made, viz. with iron, and not with steel. With a point of soft iron there is no real security; because, the point soon becomes dull, and does not maintain its hold of the bone. The point ought to consist of well tempered steel, and should be made as sharp as possible—but very much bevelled.

There is a vast variety of instruments prepared for the delivery of the head, in cases of deformed pelvis. Dr

Davis of London has invented a great number of them, some of which I have had occasion to use, but with less satisfaction than I expected to have, from the strong recommendation bestowed upon them. I am now well convinced, that a great apparatus of this sort is not at all necessary, as I think will be convincingly shown in the sequel of this article, in which, I shall describe an instrument capable, with the occasional aid of one sharp crotchet and a perforator, of effecting the delivery of the head in the most restricted pelvis from which delivery is at all possible.

As this volume is not designed to be drawn out to a great length, I am constrained to make many of the remarks that I could otherwise find occasion to offer, more brief than is compatible with a copious detail of the subjects. This necessity induces me to give at length, the history of a case of labour in a deformed pelvis that was under my care in the year 1831. It was drawn up by my friend Dr George Fox, and published in the North American Medical and Surgical Journal, vol. XII. page 484. It may, perhaps, serve sufficiently well, to set forth the difficulties and embarrassments with which such cases are surrounded, and the success of it, probably the most difficult obstetric operation ever performed in this country, may encourage those who shall hereafter have the misfortune to contend with similar cases, to hope for success, in the midst of the greatest obstacles. I consider it more instructive than any merely didactic remarks that I could compress into these pages.

“On Tuesday, June 14th, 1831, I was called about seven A. M. to see Mrs R—— in labour with her first child; this is stated to have commenced about one A.M. The pains, as are usual in the commencement of labour, were feeble, short, and at about ten minutes interval. Upon examination per vaginam, the projection of the sacrum was immediately felt: not, however, suspecting the deformity which was subsequently found to exist; this was not at the time particularly attended to, the os uteri was sufficiently dilated to admit the finger and feel the protruding membrane. I was struck with the form of the sacrum: the rectum being very much distended

with feces, I thought it might, in part, be occasioned by this. Directed *ol. ricini* one ounce, which was taken immediately: at noon found, upon examination per vaginam, that the membranes had ruptured, the head presenting: she was not aware at what time the waters had escaped. In the evening, the rectum being unloaded by the operation of the oil, I made a more minute examination, and was sensible of great deformity of the pelvis, though not to the extent we afterwards ascertained, the pains not being at all active. As it was late, I determined not to ask the assistance of my medical brethren till the following morning; therefore directed an anodyne (which I subsequently ascertained was not taken, from her dislike to laudanum and fear of its retarding her labour) and left her for the night. Was called up about one o'clock the next morning, her pains being more frequent and stronger; found the *os uteri* rather more dilated, and the external parts very rigid, preventing an accurate examination of the pelvis; I remained with her some hours; subsequently called upon Dr James, who met me in consultation at half past eight A. M. In consequence of the rigidity of the soft parts, we found it impossible to make any satisfactory examination; we therefore concluded it best she should be bled and take an anodyne—that we would meet in the afternoon: she was accordingly placed erect in bed and bled to incipient syncope, which was after losing about fifteen ounces; twenty drops of laudanum were soon after given. In the afternoon Dr James again saw her: from as accurate an examination as we were capable of making (for the external parts still continued rigid, though somewhat relaxed since the bleeding), we came to the conclusion that there were not at most three inches in the antero-posterior diameter; that laterally there was rather more room, on the left more than on the right; the posterior lip of the *os uteri* was swollen and succulent, forming a cushion in front and a little below the projection of the sacrum; the head was presenting to the left side, its exact position could not be determined. On account of the unusual interest of the case, Drs Meigs and Lukens were invited to attend; Dr James not feel-

ing quite well, did not meet us that night: the result of the examination of these gentlemen was, that there was not more, if as much room at the superior strait as we supposed; they coincided with us in the opinion that it was impossible the child should be born alive per vias naturales: our next object, therefore, was to ascertain whether or not the child was living; this was rendered certain by the application of the stethoscope; the pulsations of the child's heart were distinctly perceived, whilst the placental souffle was also very evident; the pains continued as they had been most of the day, recurring every four or five minutes: we remained with her some hours, when we ordered her an opiate, and agreed to meet at four A. M. The result of this meeting was, that as the proper means of proceeding were of such immense importance, further advice should be had, and that we should meet at half past eight o'clock A. M. Dr Physick was called on, but was confined to the house by sickness; Dr Dewees was also called for, but was absent from the city. At half past eight A. M. Dr James met us, Dr Hewson being added to the consultation: it was agreed as before stated, that it was impossible the female should be delivered of a living child per vias naturales; the question then was, whether the child should be sacrificed to save the mother's life, or an attempt made to save both mother and child. It was concluded, as the strength of our patient was good, her pulse only eighty-four and strong, as there were no symptoms of constitutional irritation, no injury would result from a few hours delay; we therefore separated to meet at twelve M.

“The consultation was held at the appointed hour; by this time, after repeated and the most accurate examinations that the case admitted of, we were unanimous in the opinion, that there were not more than two inches in the antero-posterior diameter, most probably only one inch and three-quarters; the different methods of proceeding which have been proposed in similar cases were duly and maturely considered, viz. the division of the symphysis pubis, the Cesarean operation and cephalotomy; the first was considered inapplicable to the pre-

sent case; the Cesarean operation was thought to be attended with so much risk to the mother, as almost to be necessarily fatal, some of the most distinguished surgeons being decidedly opposed to its performance. Dr Physick, who was called upon in the course of the morning by Dr Meigs and myself to ask his opinion on the propriety of this operation, was decided and positive in his opposition to it; under the weight of such authority, the idea of the Cesarean operation was abandoned. It was therefore concluded, after the most mature deliberation, and upon viewing the case in all its bearings, that the life of an imperfect being (for it was again ascertained that the child was living and apparently vigorous) should be sacrificed to save the life of a wife and daughter, and that the operation should be immediately commenced, by opening the child's head, breaking up the brain, and allowing some hours to elapse before attempting extraction; at my request, with the approbation of our colleagues, Dr Meigs consented to perform it; Drs James and Hewson having professional engagements were at this time obliged to leave us, to meet again at six o'clock, P. M. Preparatory to the operation, the rectum was unloaded by an enema, the urine drawn off by a catheter, and an anodyne administered; her pulse was one hundred and four. The consent of the patient, her husband and friends having been obtained, she was placed at the foot of the bed (which had previously been adjusted), the hips being on the edge, so that the perineum was perfectly free, an assistant supporting each leg; Dr Meigs then took his seat directly opposite, made another examination preparatory to beginning the operation; after having some time carefully examined, he called me, and subsequently Dr Lukens also, to make another examination, the result of which was, that the operation of cephalotomy, if not altogether incompetent to the delivery, would be attended with as much risk to the life of the mother as the Cesarean operation; it then appeared to us impossible that the cranium should be removed and the base brought through the superior strait, without the most violent exertions and great danger of lacerating the cervix uteri, vagina, &c.; that tak-

ing this view of the case, it was better to call our colleagues again together, at as early an hour as possible, to reconsider the propriety of performing the Cesarean operation: the child was again ascertained to be alive.

“Accordingly at five P. M. we again met; Dr J. Rhea Barton at this time saw our patient; our first object was to ascertain respecting the life of the child, and upon applying the ear and the stethoscope, no pulsation was perceptible in any part of the uterine region; it was then unanimously agreed (the female not having felt the child for two or three hours) that it was dead: there was now no further hesitation as to the propriety of cephalotomy, which was immediately performed by Dr Meigs, who employed the utmost assiduity and care in the management of the operation, on whose skill and unwearied attention the success of it is mainly dependent; to him I am also indebted for the following account of the difficulties, &c. which were experienced in the accomplishment of the delivery of the child.

“‘The woman being conveniently placed on her back, with the perineum projecting beyond the edge of the bed, and the legs and feet properly supported by an assistant on each side, I took my seat for the purpose of proceeding with the first part of the operation, the perforation of the cranium.

“‘A suture crossed the pelvis from front to rear, but its edges were overlapped and could afford no facilities for the operation. This suture was the right leg of the lambdoidal, as was afterwards ascertained.

“‘With Botschan’s improved craniotomy scissors, I endeavoured to penetrate the solid bone in the centre of the strait, but owing to the narrowness of the passage, and the constant interference of the os uteri, the lips of which were nearly in contact antero-posteriorly, I dared not to give to the instrument that rotatory or drill-like motion which was necessary, for without such a movement it was impossible to make any progress, as the head rose upwards and rolled freely in the superior basin whenever any considerable pressure was applied by the perforator, though the womb seemed to be pretty firmly contracted at the same time.

“ ‘ Finding this mode of proceeding unsafe for the woman, I begged permission to leave her a few minutes in order to procure an instrument better adapted to the purpose in hand. Accordingly, Mr Rorer furnished me with a large trocar with a triangular point, and having guided it with two fingers to the proper situation and kept it securely by retaining the fingers in contact with the head, I was able gradually to drill a hole through the bone, the head being pressed from above against the strait by Dr Lukens. Two other perforations were made near to the first one, in the same cautious manner; after which, I again introduced Botschan’s scissors, and having opened them, found that I had made an incision of about an inch and a half in length. Through this a slender blunt hook was introduced into the cavity of the cranium and the brain very freely broken up.

“ ‘ The poor woman, who was already very much exhausted by many hours of labour, now took an anodyne and was left to her repose, in order that the medullary matter might be gradually pressed out, and the cranium allowed to collapse so as to come more in reach of the instruments.

“ ‘ At ten o’clock P. M., I again met Drs Fox and Lukens, and the woman being disposed as before on her back, I introduced a crotchet into the cavity of the cranium, and spent some time in extracting the medullary substance, not much of which seemed to have been expressed during our absence; the head still continued on the superior strait, except a portion of the hind head which was passed down into the excavation to the left of the promontory, where there appeared to be the largest space.

“ ‘ Having removed a considerable quantity of the cerebral substance, I fixed the tooth of the crotchet into the cranium, and guarding it on the outside with a finger, exerted a very great amount of force, which had not the least effect in drawing it lower down.

“ ‘ It soon became evident to me, from several trials of this kind, that no exertion of mere strength could be of any avail to drag away the head, and if it was to be

delivered at all, it must be piece meal: but as the child had been dead only a few hours, and its skull bones were still firmly united to their inner and outer membranes, it will be readily conceived that the removal of the bones was a most difficult matter, not only on account of the firmness of their connexions, but also on account of the narrowness of the passages, the great hardness of the skull, and the great danger of wounding the parts by the slipping of the crotchet, which, under the circumstances, could be best applied on the interior of the skull, and from the swoln and succulent state of the lips of the os uteri, whose inner surfaces were in contact, and presented to the touch, the idea of a long fissure, instead of preserving a round or oval form: last and not least, the perineum was so strong and unyielding, that the greatest inconvenience arose from its pressing the fingers against the arch of the pubis with such force and so painfully, that no one could endure for any great length of time to keep up the necessary extension.

“ ‘ Being possessed of one of Dr Davis’s osteotomists, I expected to derive great advantages from its employment in the case, and accordingly introduced it with the view of cutting away portions of the bone, but the constricted state of the parts rendered it impossible to make use of it consistently with a humane regard to the safety of the patient.

“ ‘ Having ascertained, then, by fair experiment, that mere force could do nothing in the delivery, I resolved to pursue the intention of breaking up the head by means of the crotchet; and it was with great fatigue to the woman, that I picked out altogether about as much as would equal the size of one of the parietal bones, the portions consisting of fragments of the right parietal and part of the frontal bone.

“ ‘ Finding towards morning, that the progress of the operation was exceedingly slow, I went out and procured a pair of straight tooth forceps, with which I could take a firm hold of the bone and twist off portions, which after they were broken away, often took a good while to separate from their adhering membranes.

“ ‘ At four o’clock, the woman was so much fatigued that we agreed to give her an anodyne draught, and leave her to recover strength by means of a few hours’ rest.

“ ‘ The attempts at extraction had now continued from ten o’clock P. M. until four A. M., and I think the whole of the bone removed would not much exceed in quantity one parietal bone at full term; it seemed impossible to proceed with greater rapidity, and I often admitted a doubt, whether I should be able to deliver her before death should come to her relief.

“ ‘ Throughout the day, on Friday, the attempts at extraction were repeated, in presence of the gentlemen last named, and also of Drs James and Hewson, who became fully satisfied, that no greater progress could at present be made, considering the circumstances of the woman.

“ ‘ Early in the afternoon, symptoms of fever became very manifest; the pulse rising to one hundred and twelve strokes in the minute, with considerable firmness and volume; this state of the circulation being coincident with a distressing eructation partaking somewhat of the character of singultus, a great distension of the abdomen, as well as of the womb itself, from gases extricated within them. She complained, also, of great soreness of the belly, on which account she had it bathed frequently with cold vinegar and water, leaving the surface exposed to the air.

“ ‘ In order to counteract this new state of things, she was bled six ounces and took a portion of castor oil.

“ ‘ Dr James who had witnessed in the morning the difficulty with which the extraction of portions of the cranium was effected, was good enough to supply me with a complete set of Dr Davis’s craniotomy forceps, and returned to the house in the afternoon to our assistance. These instruments were applied, but they were incapable of effecting so much as even the straight tooth forceps. The teeth of the instrument could not be made to penetrate the skull, although most accurately adjusted; and notwithstanding the handles were brought so nearly together, that the style on the one handle went quite to the bottom of the socket in the other, every at-

tempt to extract with them resulted in the slipping of the bone out of the gripe of the instrument; a proof at once of the hardness of the bone, and of the impossibility of bringing it down in its then condition.

“ ‘ Putrefaction now rapidly advanced as indicated by the odour of the discharges, and my only hope for the escape of the patient rested on the opinion, that she might be supported a few hours, until the softening of the tissues should enable me to draw down larger portions of bone by admitting of the pericranium and dura mater being peeled off with a finger nail, while the bone should be secured, and drawn down with the forceps or crotchet.

“ ‘ But such was the unpromising state of affairs, that the poor creature resolutely refused to make any further effort to escape, saying she knew that she must die, and would rather die than exert herself any further, and begged in the most piteous tones that all further attempts to deliver her should be abandoned, yet expressing her thanks for the efforts that had been already made.

“ ‘ She was at times slightly delirious. After explaining to her the increased facility which began to exist, from the rapid decomposition of the fœtus now going on, and endeavouring to reassure her with a promise to deliver her in the course of the night, she was again left to rest three or four hours under an anodyne draught. During the whole period that has now been spoken of, the anterior lip of the os uteri was behind the triangular ligament of the pubis, and the posterior lay down beneath the promontory, and strangulated, as it were, or buttoned by the part of the head that lay on the strait and partly within it: yet so swelled that their inner surfaces continued nearly in contact, except when parted by the introduction of the fingers.

“ ‘ The perineum seemed to have acquired no disposition to relax, notwithstanding all the handling to which the parts had been subject; and, excepting that the bones were more easily detached now than before, no greater comfort or facility was enjoyed by the operator now than at the commencement.

“ ‘ At ten P. M., I again met Drs Fox and Lukens,

and the patient, after much entreaty and argument, resigned herself unwillingly to the further prosecution of our attempts to deliver. The remains of the head were still high up, but some of the broken edges came lower down. I got hold of a piece that descended behind the pubis, and with the tooth forceps pulled it downwards, detaching the membranes as it advanced, and found that it consisted of all the remainder of the right parietal bone. I next got away nearly the whole left parietal, and afterwards with the crotchet removed first the right, and then the left orbital portion of the os frontis, which was all that remained of that bone. I then got away with the crotchet and forceps, the right superior maxillary, and afterwards the left superior maxillary bone. I subsequently twisted off the greater part of the broad portion of the os occipitis, and the squamous parts of the temporal bones; so that I had nothing left now but the base of the skull and the lower jaw, which latter I left as a point on which to exert the tractions that were soon to be required.

“ ‘If the estimate made by all the gentlemen, that the strait was not more than two inches in its antero-posterior diameter, should prove correct, I was fearful of meeting some difficulty in bringing the base of the skull, which was two and a half inches, through it; but when I had reduced the head so as to leave nothing more than the base of the skull and the lower jaw, I fixed a blunt hook into the latter, and with a finger to antagonize it, drew the mass down towards the point of the coccyx, and had the satisfaction to find that it was now quite through the strait. My hand being now introduced into the vagina, I got a firm hold of the neck, and with the exertion of the greatest strength, gradually brought the button-like remainder of the head out at the vulva, while the point of the thorax, of course, was entering the narrow pass. The head was delivered at a quarter after one o’clock, and having succeeded in effecting the most difficult and dangerous part of the operation, she got some ergot; and fastening a twisted towel round the neck of the fœtus, I renewed the extractive efforts, which in twenty minutes enabled me to deliver the shoulders,

and in twenty minutes more, the hips—the child being completely withdrawn at five minutes before two o'clock, which was forty minutes after the head was delivered.

““I found that, under the stimulation of the ergot, she was enabled to bear down very strongly, considering her exhausted state, and at all events, the chief object of its exhibition was secured, viz. a firm contraction of the womb, and an effectual separation of the placenta, which came into the os uteri soon after the delivery.

““Large quantities of gas of the most putrid odour followed the extraction of the child, showing the enlargement of the womb, before spoken of, to have been owing to its extrication by the putrefactive processes going on in the uterine cavity.

““The cord was shrunk and black, and the placenta, which was also black, and filled with air, so as to crepitate under the fingers, was so horribly noisome that it was scarce possible to endure it during the requisite handling of it. No blood followed the placenta.

““The body was soft and putrid, being completely emphysematous and crepitating like the placenta. The cuticle was peeled by the pressure and friction.

““The child was rather above the medium size.

““After washing the poor creature with a sponge dipped in claret and water, and making her as dry and comfortable as possible, she got an anodyne and was left to rest, being unable to speak above a whisper, and with a pulse feeble, but beating only one hundred and two strokes per minute.

““The whole difficulty in delivering a child through so contracted a pelvis, can scarcely be conceived of by one who has not been engaged in such an operation. The constant and perplexing apprehension of injuring the mother, either with the instruments employed, or with the sharp and ragged edges of the bones which must be withdrawn, and sometimes violently broken off with the sharp tooth of the crotchet, involves the operator in the most painful and unremitted attention and watchfulness. The confusion also in the parts, arising from the remains of the scalp and the inner and outer membranes of the cranium blending themselves, as it

were, with the os uteri, and covering and concealing the bones, is a source of great embarrassment, where those fibrous tissues retain so much firmness and compactness.

“ ‘Doubtless, could we have known that the woman would have been able to bear the fatigues of labour so long, we should have deferred the efforts at extraction for twenty-four hours after the perforation of the head; but such was not the opinion to be gathered from the actual phenomena.’

“ ‘It has been seen that no great loss of time took place, after the softening of the tissues rendered it possible to break them up with some facility, whereas the process previously was exceedingly slow and tedious. The perforation was deferred as long as possible, which saved us from the dreadful and cruel operation of cephalotomy in a living fœtus. The child died from long continued pressure.’

“ June 18th, (Saturday) nine A. M. Our patient says she feels quite comfortable; had some sleep after we left; pulse one hundred and twelve, rather more feeble; skin moist, tongue slightly furred; clean linen, &c., was put on her, and she was moved up in bed. The bladder was emptied by the catheter; fomentations with flaxseed mucilage directed to be applied to vulva, the most perfect rest and quiet strictly enjoined; as diet, arrow root and oatmeal gruels, tea and toast.

“ Evening. Remains much the same; bladder again emptied; mucilages continued; an anodyne to be given at ten P. M., if at all restless.

“ 19th, nine A. M. Passed a comfortable night, pulse ninety-four, skin pleasant, tongue slightly furred, lochia almost natural; free from pain; slight soreness over pubis to left side, directed warm brandy to be applied over soreness, a seidlitz powder to be given, and repeated, if necessary; continue other means.

“ Evening. Medicine not having operated, an enema of warm flaxseed mucilage was directed, and an anodyne at bed time.

“ 20th. Rather restless in the early part of the night; enema operated freely; feels very comfortable; no pain;

pulse seventy-six; skin pleasant; tongue continues slightly furred; countenance good; spirits cheerful; continue as before.

"23d. Our patient continues to do well, usually rests well at night, free from pain, although the soreness in uterine region continues; secretion of milk copious, feels so comfortable that she has taken an infant to nurse, pulse rather more frequent than natural; tongue clean and moist, bowels costive, passes urine without difficulty, the catheter was used three times daily till last evening, when it was found to be unnecessary, lochia serous; directed *ol. ricini*, one ounce. Mucilages to vulva to be continued, mucilaginous injections per vaginam, continue diet, and perfect rest in horizontal position.

"From this time our patient continued rapidly to improve; in three weeks from the time of her delivery was so well as to be permitted to go down stairs, and in a short time resumed her ordinary avocations.

"The subject of the preceding case is a native of Ireland, aged about twenty-two years, of small stature, not exceeding four feet and a half; is stated to have been a healthy child till her third year, when she received an injury by a fall, after which she was unable to stand or walk for two or three years; at the expiration of this time she regained her strength, and was subsequently considered an active child. Upon examination, we found the femur and tibia of each extremity very much curved, forming a considerable arch forward; at the lower part of the spine, there was a cavity sufficiently large to admit the hand corresponding with the promontory of the sacrum internally; the bones of each arm partook of the general disease. It was evident she had in early life laboured under rickets."

In cases where the diameters of the pelvis have been so much diminished by rachitis or mollities ossium, as to render the descent of the foetal head impracticable, it has been the universal custom either to perform gastrotomy, or to lessen the size of the cranium by evacuating its contents, and then make extraction by means of the sharp crotchet.

The method last spoken of is a good one, perhaps, and succeeds well enough where the diminution of the pelvic passages is not too considerable: nevertheless, we find, upon reference to the records, that a great many women have been the victims of such untoward labours, owing, measurably, to the violence done to the soft parts during the forcible extraction of the head, which was, perhaps, insufficiently reduced in size to admit of its transmission with safety to the mother—and probably in no less degree to the wounds that have been inflicted by the slipping of the crotchet,—a very common, and often unavoidable accident in its employment.

The firm bony structure, composing the base of the foetal skull, is nearly two inches and a half in its transverse or smallest diameter; mere excerebration, therefore, cannot be regarded as furnishing a good security against fatal contusions from the forcible extraction of such a body from a pelvis whose smallest diameter is not exceeding two inches in length. Such a body as the base of the skull, must, in order to pass through such a pelvis, present itself in an inclined attitude, or with a dip, but this dip or inclination can be but imperfectly communicated to it whilst all the bones of the cranium retain their connection with each other. To enable such a base to pass downwards safely, the skull ought to be taken to pieces, and those pieces removed in succession. In some instances, this successive ablation of the cranial bones has been effected by the crotchet, the point of which was used to pick out the bones, sometimes in portions not larger than the finger nails; as for example, in Elizabeth Sherwood's labour, so impressively narrated by Dr Osborne. Those who have perused that account, will remember the extreme perplexity of that practitioner, and the infinite pains he took in his anxiety

to avoid injuring her with the crotchet. He could not get the base of the cranium down until he had removed all the rest of the head.

Having had occasion to observe the difficulties and perplexities arising from labour in deformed pelvis, as they occurred in Mrs M. R. of this city, the case above related, whom I have now delivered in two accouchements, I venture to lay before my professional brethren, with great deference for the judgment of older and more experienced men, the impressions I derived from observing and conducting those two labours.

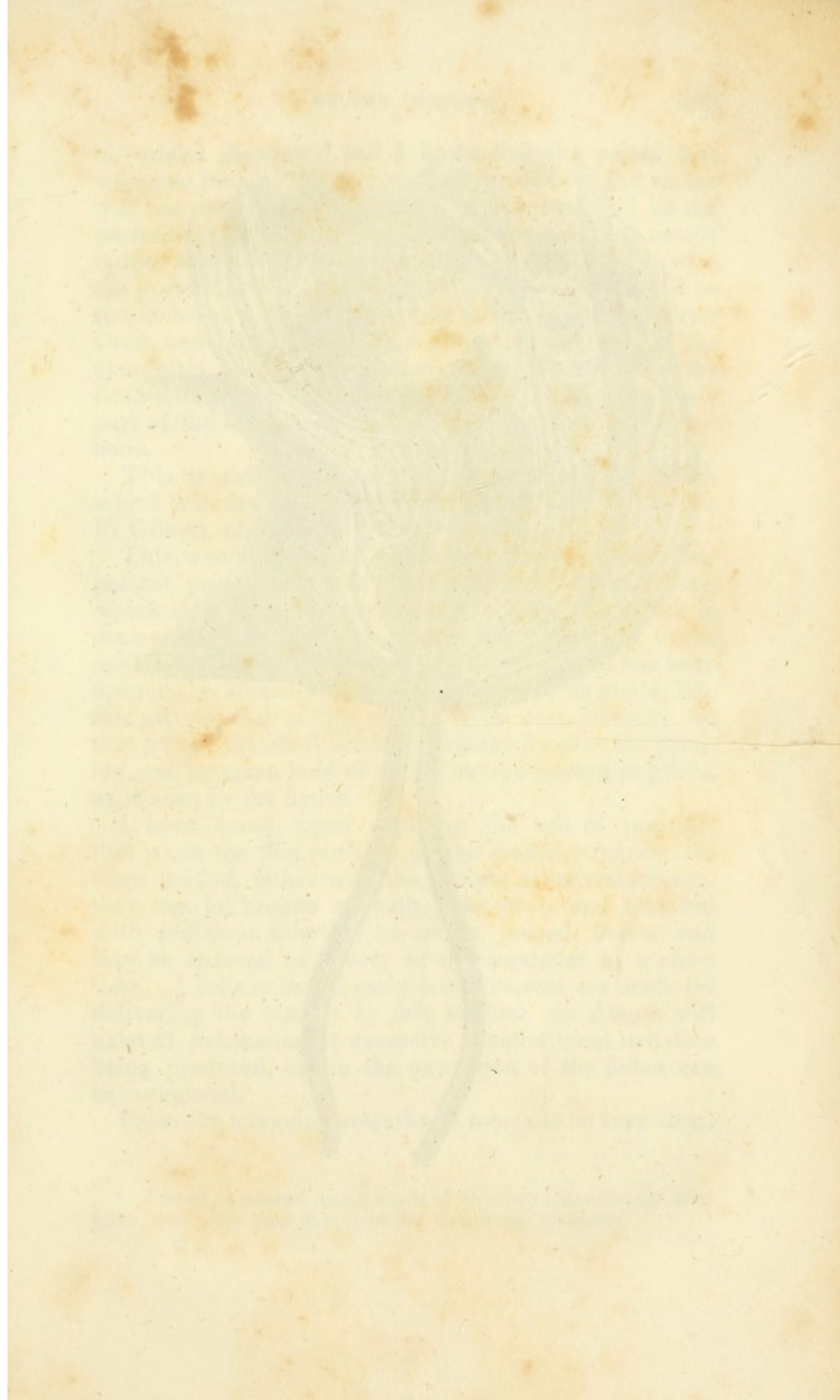
There is reason to believe that no other female has ever been safely delivered in this country, under the disadvantages of a pelvis measuring only two inches from sacrum to pubis, which, by the judgment of persons of the highest claims to confidence, is the extent in Mrs R.'s case. I speak this, however, under liability to correction. All the gentlemen then consulted, agreed that the diameter was as above mentioned.

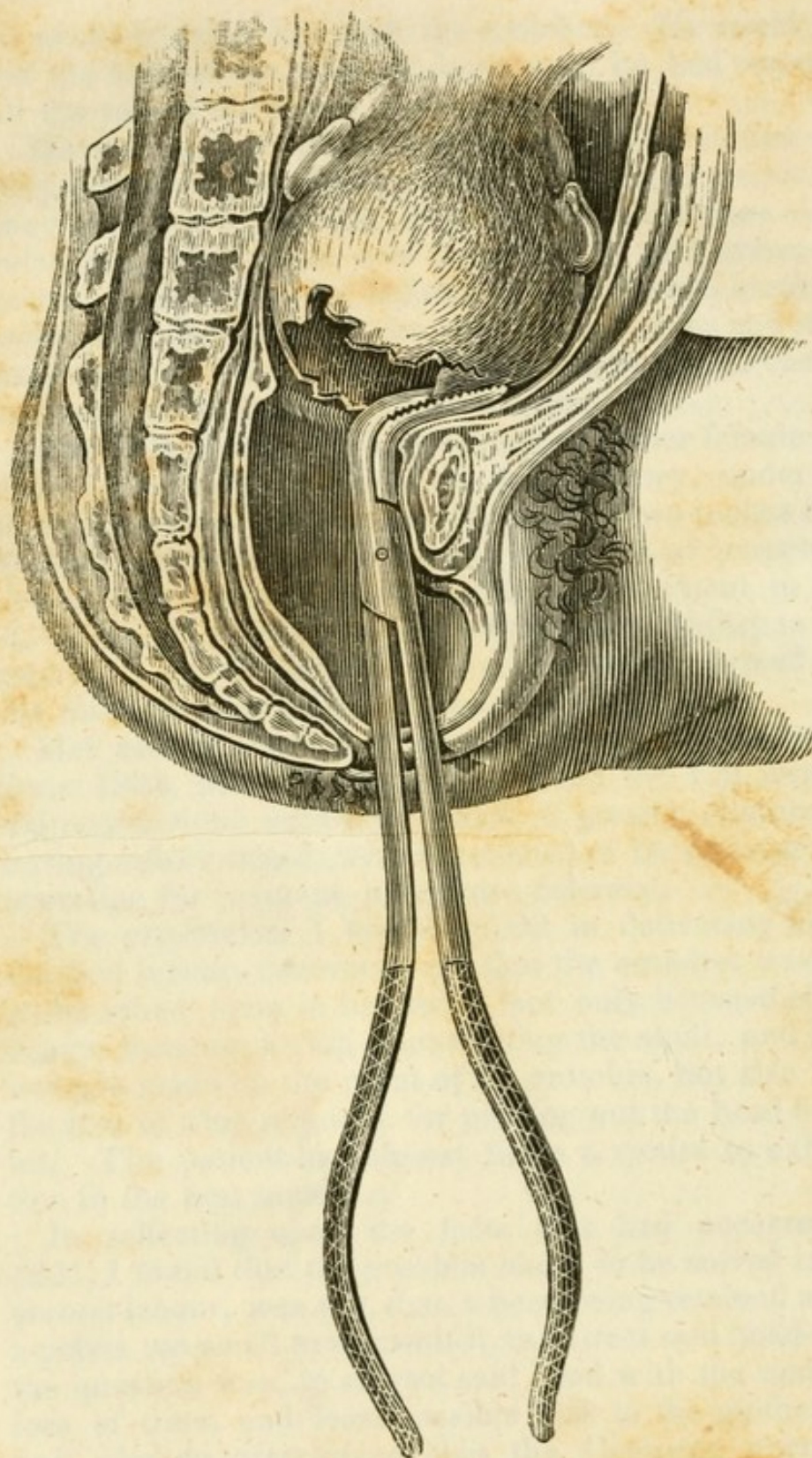
Her second accouchement took place in the month of June 1833, the child having reached the full term of utero-gestation, an event which I greatly deprecated, having vainly urged, with the advice of Dr Dewees, the operation for inducing premature delivery.

The experience I had acquired in delivering her in the first labour, convinced me that the crotchet was not to be relied upon in her case; not only because of the danger from contusion in extracting the skull, and from wounds made by the point of the crotchet, but also from the loss of time requisite for picking out the head bit by bit. The patient had almost fallen a victim to exhaustion in the first instance.

In reflecting upon the facts that had occurred in 1831, I found that the problem about to be solved in the second labour, was not, that, a head being retained above a pelvis too small to transmit it, to extract said head—but the question was, to extract said head with the smallest loss of time, and least possible risk to the mother. I had *already ascertained* that the Cesarean operation would not be submitted to.

I supposed that the head might be four inches in its





bi-parietal diameter,* and I knew that the pelvis was only two inches. Under such circumstances the vertex will not present, but the crown of the head will be the presenting part: but since the cranium cannot recede farther than is necessary to bring it in close contact with the posterior part of the mother's abdomen, there will be two inches of the head lying upon the plane of the superior strait, and two other inches projecting in front of the symphysis pubis: or, in other words, the crown of the head will repose upon the top of the symphysis pubis—part of the head being behind, and part in front of that bone.

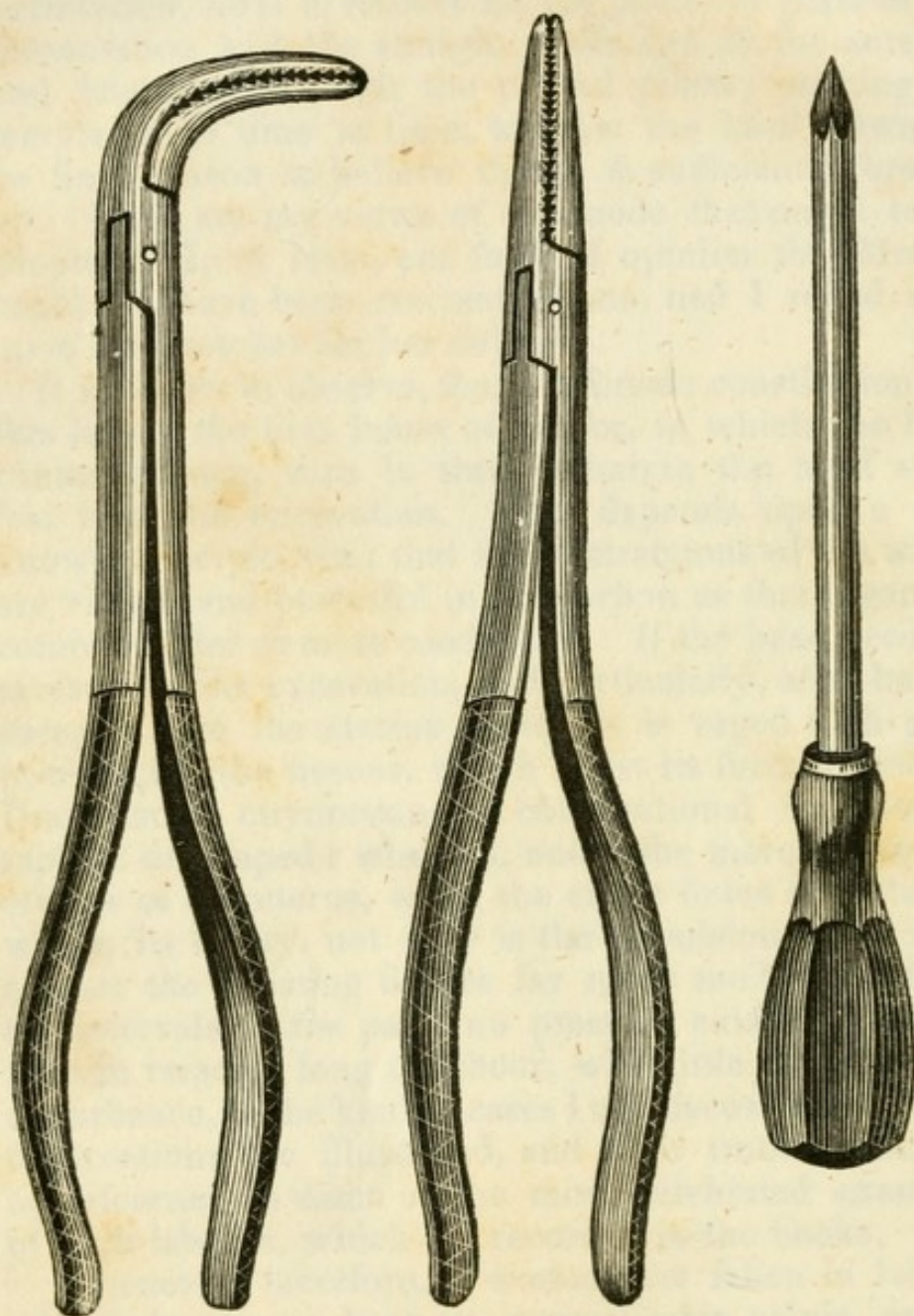
This is well illustrated in the accompanying figure, which was drawn by Mr Wm. Mason, and cut by Mr F. Gilbert, of this city.

This wood cut is also intended to exhibit a very important principle in the management of such a case, which is, that all that part of the cranium which lies in contact with the mother's back, is perpendicular to the opening of the strait, and may, when the skull has been opened, be seized with a straight forceps or pliers, like that represented in the second wood cut; whereas, all that part of the skull that lies horizontally over the opening, can be taken hold of with a curved forceps or pliers, as is seen in the figure.

I have found, upon applying the test of practice, that when the thin portions of the cranial structure are taken hold of, either with the straight or curved forceps, they can be broken up with great ease, and removed with sufficient celerity; so much, indeed, that a head may be reduced to a very small remainder in a short time. I believe that if early arrangements are made for delivering the patient by this method, no danger will exist of exhaustion or excessive constitutional irritation being produced, before the extraction of the fœtus can be completed.

From the foregoing remarks, it seems to be very clear,

* I have measured many heads of children immediately after birth, that were four inches in the transverse diameter.



of its soft parts are so much lessened by maceration, in an elevated temperature, equal probably to 99° , that the extraction of the pieces of bone is exceedingly easy. I should, therefore, in such difficult cases, recommend that all attempts to deliver should be delayed, if possible, for twenty-four hours after the perforation of the head. This recommendation is founded on what I have experienced of difficulty in getting out the portions of bone after I had broken them up, when I made the attempt antecedently to the occurrence of signs of decomposition. The patient can be quieted with anodynes, and supported with light nourishment, and if needful may, by venesection and cold drinks, be kept tolerably free from vascular disturbance during the whole period of such delay as may be deemed advisable.

I subjoin a cut which shows the form of the perforator that I employed in Mrs R.'s case. It is a trocar or drill, ten inches in length from the handle to the point. I was obliged to make use of such a means of penetrating the skull, since no suture was practicable, and the common Smellie's scissors could not be made to perforate the solid bone, any direct pressure causing the head to roll, or move upwards, and any rotatory or drill like motion with it, being impossible without great danger of wounding the lips of the os uteri. The same cut exhibits both the straight and curved pliers. They are eleven inches in length; the gripe is serrated and the sides of the mandibles are rounded, in order that they may not pinch any tissues except those intended to be included in the bite, which, on account of the serræ, is very sure and strong.

I have never seen Baudelocque's (the younger) instrument, *pour broyer la tête*. Dr Davis's craniotomist, and his craniotomy forceps, were found incapable of useful application, upon several attempts that I made to use them in my cases.

CHAPTER XVII.

INVERSION OF THE WOMB.

WHEN the womb is relaxed or uncontracted after the delivery of the child, no attempt ought to be made to take away the after-birth, by pulling at the navel string. Should the placenta be still adherent to the fundus uteri, any tractions exerted on the cord, would tend to draw forth the after-birth, which might drag the fundus uteri along with it, and thus turn the organ inside out, or invert it. Inversion of the womb is one of the most dangerous accidents that can happen to a lying-in woman; it is always attended with severe pain, and the most violent hemorrhage, and if not early remedied, becomes irremediable, since it would be as easy to turn a non-gravid womb inside out, as to restore an inverted one, when many days have elapsed after the occurrence of the inversion.

Those who have had the hand in utero, in turning, can well appreciate the exceeding laxity of the womb, when not affected with the pains; they can readily conceive that the mere weight of the after-birth, still attached to the fundus, might cause a commencement of inversion, which could become complete by means of the woman's strong voluntary efforts to bear down her pains. It is not to be doubted that instances of inversion have occurred in which the practitioner deserved no further blame than that for not taking the proper precautions against its occurrence by a bandage and compress, and

by commanding the patient to preserve the horizontal posture.

Notwithstanding the occurrence might take place spontaneously, and immediately after the birth of the child, yet, in a major part of the examples, it has been produced by an improper haste and impatience to get away the after-birth.

I have seen but two persons who have had *inversio uteri*, and they are both recovered; one, Mrs S., was already the mother of two children when she became again pregnant of the child born in June, 1831.

It seems that having on both the preceding occasions suffered severely from the method adopted by the physician in removing the after-birth, and supposing that a midwife would deal more gently with her, she engaged an old woman much accustomed, as it was said, to the care of women in labour, to attend her upon this occasion. The child was born by a very easy labour, but the after-birth not coming away so promptly as was desirable, tractions were made upon the cord which caused the after-birth to come into the vagina. This gave the patient exquisite pain. The midwife, who could not understand why the woman should suffer so severely, made haste to draw the placenta forth by the cord, which made her cry out so loud that it was said her voice was heard in the street. When the mass came away, the good woman found it still adhering to something, so that she could not take it up and put it into a basin. She therefore continued to pull at it with great force, not knowing that she held in her hand the after-birth still adhering to the fundus of the womb, which was now completely drawn forth and turned inside out. The hemorrhage was enormous, and the patient soon sunk into the extremest weakness and exhaustion. Half an hour elapsed before she thought proper to confess her incompetency to manage the case. I was sent for, after she had acknowledged her ignorance of the method of proceeding, and when I arrived the patient was without pulse—very cold, suffering the extremest distress, with constant jactitation, and a thirst that was unappeasable. To all appearance the woman was in the agonies

of death. I found the globe of the womb hanging down full half way to the knees, and still invested with the placenta and membranes, except those parts where they had been torn and broken by the attempts of the midwife to pull the entire mass away.

I endeavoured to push the whole womb and placenta back into their natural position, but finding I could not succeed, I sent for my venerable friend Dr James, who speedily arrived. Dr James now made an attempt to reposit the womb, but he also failed. By his advice I then removed the placenta, but could not force the uterus up into the pelvis.

In making the attempt to restore it to its place, I followed the method recommended in the books, that is, I compressed the organ in both the hands in order to reduce its size. At last I observed that the more I handled it, the firmer and harder it became; in short, that I excited in it the after-pains just as we excite them by frictions on the hypogastrium after the child's birth. I therefore inferred that the proper way of proceeding would be to let it rest, and as soon as the relaxation of the organ should be complete, to endeavour to indent its fundus, like the bottom of a bottle, and then carry it upwards. I found, upon observing it, that the womb repeatedly expanded or relaxed, and then contracted again. Taking therefore the moment of the completest relaxation, I indented the fundus with one finger, and as it became more and more concave, I applied each of the fingers in succession, until I found that its further progress was impeded by the os uteri, which, although it was completely inverted, yet resisted for some time the attempt at reposition. By a resolute perseverance I finally had the pleasure to overcome the resistance, and the peritoneal surface of the fundus was pushed upwards beyond its os uteri, and at last the womb was found to be completely restored to its natural position, but still containing my hand, which was now up as high as a little above the umbilicus. As no contraction came on immediately, I retained possession of the cavity of the womb, which I gently excited by moving my fingers within it, and finally a contraction came on which I suffered to push my hand out into the vagina. Upon

withdrawing the right hand, I felt with the other the womb very firmly contracted in the lower belly, and enjoyed the satisfaction of complete success in this distressing case.

I have said nothing of the brandy and volatile alkali that was given to the woman to keep her from dying. She took a very large quantity of these articles, besides laudanum, before I left her, which I was obliged to do in order to attend to another patient, and I feel under great obligations to my friend Dr George Fox, who came at my request and took charge of Mrs S. for the remainder of the time that she continued ill. Her situation when I gave her up to his care was nearly desperate, from anemia; nevertheless, by the administration of proper restoratives and the judicious exhibition of stimulants, during several hours, she rallied, and, in no very long time, recovered a good share of health.

From that period she has never been quite regular as to the catamenia, which have appeared at uncertain periods, and less abundantly than before her dreadful accident.

Mrs S. is again pregnant, and is now advanced to between the fifth and sixth months, more than five years having elapsed since the birth of the last child.*

I cannot refrain from mentioning here the case related by Mr Charles White, of Manchester, in which he succeeded in restoring an inverted womb to its natural state by compressing it, and then pushing it up. In his case I am not very sure that the inversion was complete, since, although he represents the inverted uterus to have been as large as a child's head, it was never expelled through the external organs, and it is improbable that if fully inverted it could be retained in the excavation. Mr W. regards his method as of the very highest importance, and thinks he should never have succeeded but for the compression of the womb in the hand.

* Since the above paragraph was written, Mrs S. has been safely delivered of a healthy child by my friend Dr Bache. It is worthy of remark that the placenta was adherent in this case also; and Dr B. was not able to effect the delivery of the after-birth until he had separated it from the womb by the introduction of the hand into its cavity.

I am ready to admit that it might happen that a tonic contraction of an inverted uterus should come on at once, and last so long as to prevent the employment of the plan that I suggest; but I think it probable that it would always be practicable to return it, in any case where it had not been inverted more than four or five hours, by waiting for the moment of its greatest relaxation, and then first indenting the fundus, and afterwards pushing it steadily upwards through the os uteri, and so into the abdomen again.

I have recently seen a lady whose womb was inverted about two years ago, at her confinement. I am informed that she then had a very profuse hemorrhage, and was thought to be in extreme danger. She gradually got better, however, but remained subject to frequent attacks of hemorrhage, by which her strength became greatly reduced. At length a physician whom she called in made an examination, and found the womb inverted. In this case the womb hangs into the vagina, and is, I think, turned completely inside out; it is not much larger than the healthy non-gravid womb—does not appear to be very sensible on pressure, but bleeds very easily. By careful regulation of the diet, strict attention to her bowels, and the use of astringent injections, under the care of her physician, Dr Mœhring, the hemorrhagic tendencies have of late been happily counteracted and she is acquiring a more decided state of health. She goes freely now about the house, and even about the city. This I regard as a very consolatory case, as it furnishes ground to hope for the escape of our patients with life, even where the inversion is incurable.

It has been stated that when the womb is only half inverted, the woman is liable to greater pain and danger than where it is turned completely inside out, in consequence of the strangulation of the part that is gripped by the os uteri. It is thought by some persons good practice in such cases to make the inversion complete. I am unable to speak of this point from any experimental knowledge that I possess, yet I feel ready to admit that the probabilities of recovery would be greater with a complete than with an incomplete inversion.

CHAPTER XVIII.

PUERPERAL FEVER.

LYING-IN women are very liable to attacks of inflammation of the peritoneum, or lining membrane of the abdomen; and such is the tendency of this inflammation to spread like an erysipelas over the whole surface of the peritoneum, that it not unfrequently extends over the entire internal paries of the belly, producing so violent a fever and so considerable a disturbance of the functions of important viscera invested by the peritoneum, as to prove fatal in a great many instances.

Seeing that the superficies of the peritoneum is equal, probably, to ten or twelve feet, we should have abundant reason to dread so extensive an inflammation, from the constitutional irritation which it alone would produce; but when, in addition to that consideration, we take into view the great effusions which may ensue, the suppurations, the interruption of the intestinal functions, the depravation of the actions of the liver, &c., which are occasioned by it, we have still greater reason to deprecate its attack, and to seek for the justest views of its nature, and of the remedies most appropriate for its cure.

Peritoneal inflammation occurs more frequently in women in child bed than in any other class of persons. It generally follows labour within from two to four days; but it may occur either earlier or later; sometimes, making its attack even before labour begins, and being

deferred in other cases until the third week of the confinement, or even later.

The subject is predisposed to it, probably from various causes, among which are the severe pressure which occurs during the expulsive efforts for delivery; the extreme distension which the membrane has suffered in the last weeks of gestation; the violent excitation of the womb itself by the labour pains; and lastly, the complete relaxation of the membrane and its adjacent tissues, following the birth of the child.

The pressure produced by the bearing down of the woman in labour is often so great and so long continued, that an effect analogous to contusion cannot fail, in many instances, of taking place, since the whole muscular power of the abdominal muscles is expended in propelling the uteri fundus towards the os uteri. Such contusion of contiguous portions of the peritoneum would be readily followed by inflammation, and the more readily in proportion as these efforts might have been greater, or longer continued, and, in fact, we do find that bad labours are more apt to be followed by peritoneal fevers than easy or good ones.

The peritoneal coat of the womb is greatly expanded or stretched in the last stages of pregnancy. The broad ligaments are drawn up on the sides of the uterus to a considerable height, while the portion of the membrane that lines the front and sides of the belly, is also put greatly on the stretch. This tension could not but increase its natural proneness to take on inflammatory action, if exciting causes should be applied after delivery.

The womb itself is left after labour with so great a disposition to inflame, that very slight occasional causes suffice to set that disorder on foot in the structure of the womb itself, which may serve as the radiating point for a peritonitis that shall involve the whole extent of the serous tissue of the belly. It is very common in the post mortem examination of puerperal fever cases, to find the results of inflammation not only on the serous coat of the uterus, but also in its proper structure, as well as in that of the ovaries. These results are evinced in the effused pus found in the substance of those organs, and in their veins.

The relaxation of the peritoneal membrane that follows delivery, and the reduction of the womb to a small size, is beyond doubt one of the most fruitful sources of inflammation of the membrane. The sanguine determinations are greatly affected by the relaxation of the muscles and integuments of the belly, consequent upon the complete contraction of the womb. It will not be denied that the blood that escapes from the aorta by the coeliac and the mesenterics, as well as that which passes along the spermatic and uterine arteries, will meet less resistance to its flow where the tegumentary and muscular tissues of the abdomen are quite flaccid and devoid of tone, as after child birth, than where they are in a state of great tension, as before labour commences; but if the blood of the chylopoietic organs reaches their capillary vessels with less resistance or greater facility, then, those organs will be more liable to sanguine affluxions, engorgements, and irritation, on account of this very weakness and relaxation.

A similar liability exists for patients who have been tapped for ascites. Such patients are extremely apt to be seized with peritonitis, which, however it may be in a measure considered as a consequence of the wound made by the trocar, is, nevertheless, more apt to ensue in such as are not carefully bandaged after the tapping, than in those who procure a proper degree of compression by a bandage which serves as a substitute for the tone, or rather resistance of the muscles and integuments, which is almost wholly abolished, at least for some hours or days, by the drawing off of the water from the peritoneal sac, as it also is after delivery.

Taking this view of the tendency which the relaxation, or want of tone or support, occasioned by delivery, gives to attacks of peritonitis, I find it not surprising that those women who get up too soon, or sit up too long, should suffer more readily than those who preserve a horizontal posture for several days after childbirth. A woman who gets up very soon is much exposed to the dangers of flooding from the sudden engorgement of the uterine vessels, occasioned by a vertical position. The hemorrhage that often comes on in consequence of this

imprudence is an effort of nature to relieve the engorgement of the abdominal and uterine blood-vessels, produced by a too early getting up; but, where this relief is not procured by evacuation of the engorged vessels, inflammatory excitement may supervene, especially if the centripetal determination of the blood is augmented or reinforced by the occurrence of chills, to which the woman is more obnoxious out of bed than in it. Not a few of the cases of peritoneal inflammation that have come under my notice were clearly attributable to the imprudence of the patient in getting too soon out of bed. Such an act of imprudence ought not to be permitted.

Vascular excitement, from whatever cause produced, may become fixed upon the serous membrane of the belly as an inflammation possessing all the dangerous characteristics of child bed fever; a common milk fever, therefore, ought not to be permitted to become very violent, lest it might produce the result just mentioned. It should be fully reduced by venesection and cooling purgatives, and above all, by a strict observance of the horizontal position. Fever of any kind coming on soon after delivery, includes at least a risk of an attack of peritonitis.

Improper diet, and whatever might occasion indigestion, should be carefully avoided, lest the intestinal irritation, if severe, should become peritonitis in one predisposed that way. I speak upon this point from my own observation, having recently seen two women, both of whom had peritonitis from indigestion occasioned by the use of a kind of food which is very generally given to lying-in women. Great care should be taken to avoid all indigestible kinds of food.

Costiveness, a very common complaint towards the close of pregnancy, should be obviated by the administration of gentle aperients or enemata. An overloaded state of the bowels might very reasonably be supposed sufficient to excite irritation in the abdomen, which, in individuals predisposed to peritoneal inflammation, would become fixed at last upon the serous surface.

Suppression of urine, an occurrence frequently met with in obstetric practice, should be carefully watched,

since an undue degree of distension of the bladder can scarcely take place without *endangering* the life of the lying-in woman, from the tendency which accompanies it, to excite the first movements of peritoneal fever. It should always be regarded as a part of the duty of the medical attendant, to inquire into the state of the bladder; and it is far better to resort at once to the catheter for relief, where there is any reason to suspect an accumulation of water, than to confide in the various diuretic drinks, or even to the enema, which, although less disagreeable, are far less certain remedies than the catheter. It is scarcely ever proper to defer a recommendation of the use of the catheter, where many hours have elapsed after delivery, without an urinary evacuation, even if the patient complains of no pain. I have observed, in some instances, a very great collection to be unattended with decided pain.

It is highly important to pay a strict attention to the after-pains, of which puerperal women so commonly complain. If they go off perfectly—leaving intervals between the contractions; and especially if, in those intervals, there is no soreness of the hypogastric and iliac regions, upon pressure made thereon with the hand, they are of little consequence—but when they do not leave the patient with good intervals of freedom from pain, they should be held suspected, and quelled by anodyne doses, by enemata, and even by the use of the lancet. Obstinate after-pains—particularly those which continue for several days, not very rarely serve as the masks of a peritonitis, which is the more dangerous, from having, by its insidious approach and attack, beguiled the unwary practitioner, until his means of resistance, which, at the beginning, might have proved completely adequate—have, by procrastination, lost all efficacy. In urging the attention of the practitioner to this point, I by no means wish to be understood as asserting that it is always easy to discriminate between after-pains and the early stages of a peritoneal fever—on the contrary, it is on account of the difficulty of making such a diagnosis, that it becomes important to attend sedulously to the symptoms. Those peritoneal fevers, and they are not

few, which are connected with an inflammation of the uterine sinuses, are the most dangerous—and I have no doubt that some of the very distressing after-pains which we meet with in practice, but which we subdue, are occasioned by a high degree of inflammatory irritation of the uterine texture, whose course being happily checked, leaves us without any fatal or post-mortem evidences of its existence. I am free to say, that I have often been very much embarrassed to decide whether my suffering patient was affected with mere spasmodic contractions of the womb, or whether she laboured in addition to such spasm, under an inflammation of that organ. I have many times abstracted blood freely for the relief of the symptoms, and, obtaining complete relief, have remained still uncertain whether my remedy had put a stop to spasm merely, or whether it had overcome an incipient inflammatory excitement of the uterus and ovaria, by which the patient was exposed to the greatest dangers of peritoneal fever. I will beg leave to repeat, that after-pains ought to be carefully watched, and when accompanied with an excited circulation and tenderness of the hypogastric region, should be met by free depletion as the chief of remedies. There are other remedial measures that need not be again spoken of here.

Puerperal fever, generally, is ushered in with a chilly fit, more or less considerable, and of various duration, but ordinarily not very long; the pain which accompanies it, commences in the hypogastric or one of the iliac regions, and increases and extends its limits as the fever augments. The fever is occasionally very high—while the pain is not very intense, and in the epidemic cases of the malady, some women are met with who do not even complain of pain at all, notwithstanding the most active inflammatory changes are going on in the abdomen, as disclosed by post-mortem examinations.

The vascular system reacts with the greatest promptitude, when moved by peritoneal inflammation; the pulse acquires a frequency, rarely less than 120, and commonly of 140, strokes per minute. In the early stages of this vascular re-action the artery is full, strong, and possessing the characters of the synochus fortis pulse:

but this high grade of energy is soon passed ; the pulse acquires greater frequency with diminished hardness and volume. If the inflammation, like a rushing fire, seizes on the whole serous membrane, the constitutional irritation which is produced by it, rapidly exhausts the vital powers, and the patient sinks very much in the way that those perish who have suffered extensive laceration or fatal injuries of some great articulation. All remedies are useless when the whole nervous and vascular systems have suffered a shock sufficient to overthrow their functional power, and the patient sinks rapidly, in despite of the cordials, the opiates, the counter-irritants, and other appliances which are, in a sort of desperation, resorted to by the medical attendant. A child-bed fever should be cured very soon, or it will scarcely be cured at all ; and why should we expect to cure a peritonitis which we have reason to suppose connected with an inflammation of the whole serous membrane ? If a small part of that membrane only be affected, as is the case in the commencement, we may hopefully endeavour to effect a resolution of the inflammation by bleeding, &c., but when it has had time to be wholly involved in inflammation, I think any experienced practitioner will agree with me in expecting the inflammation to result not in resolution but in effusion ; which effusion ends in death very commonly.

Such is the rapidity with which the peritoneum becomes universally involved in inflammation, that not a few persons have, in their writings, brought into some discredit the use of the lancet as a remedy, their own judgments having been staggered by the vain employment of the remedy in stages wherein the loss of blood could not do good, and seemed only to precipitate the fatal result. A woman, for example, may be attacked with the disease after the physician has seen her in the evening ; the nurse, who supposes that all pain in the abdomen is after-pain, and all fever, milk fever, does not become alarmed, and when the physician arrives, he finds the patient already far advanced in, or at least on the point of those effusions into the peritoneal sac, which, while they put an

end to the pain, also seal the fate of the unhappy mother. Such events have occurred under my own practice.

I would earnestly endeavour to impress upon the mind of the student of medicine, the vital importance of great promptitude in his attention to the earliest signs of this dreadful malady. I would convince him that the principal feature in the disease called child-bed fever, is peritonitis—that the inflammation is so acute, and the tissue in which it is seated so inflammatory, that the malady is capable of hurrying through its curable stages more rapidly than even the redoubtable croup, and what is of still greater moment, that it is in the incipient stages nearly as curable as croup, and that the remedy, or I might say the cure, consists in the bold and judicious employment of venesection. Let me ask, what can be the value of any remedy, short of venesection, in a malady like this—which presents a case of pure inflammation—occupying, or making haste to occupy, not a few square inches, but many square feet of a membrane that serves as the investment of the most important organs. In what light, save as mere *juvantia*, can any reasonable man regard the few grains of calomel and opium, or ipecacuanha, or the few drops of spirits of turpentine, which are by some persons given as remedies for such wide extended mischief! Nothing but abstractions of blood can have an immediate and potent influence on the circulation, and reduce the momentum of the blood to such a degree of moderation, as may consist with a resolution of the inflammation. Peritonitis always has one or the other of these two terminations—resolution or effusion; with the former the patient recovers, with the latter she dies. Dr Gordon tells us, that it is not merely bleeding the patient that will save her. She must be bled copiously—so copiously as to give to the disease a definitive check. He tells us that where the woman is bled timidly, no available impression is made, that the disease advances and soon becomes indomitable. Twenty-five or thirty ounces drawn from the arm, early in the attack, rarely fails to make so powerful an impression on the disorder, that the *juvantia*—such as

calomel, opium, &c., hardly fail to effect the remainder of the cure.

All the experience I have had in regard to the course and treatment of this malady, leads me to concur fully with the instructions of Dr Gordon on the subject, and it is always with regret that I reflect on the published opinions of Gooch and others, who appear to bring into distrust the best of all possible resources for the management of this violent disease. I am almost ready to say, that the case of peritonitis which will not admit of the use of venesection is hopeless—that all other medical measures are trivial when compared with its prompt and salutary influences; and also, that I can with difficulty conceive of a case of the disease in which the lancet would be inadmissible in every period of its origin and progress; there should be found *some* point of time in which it could be resorted to. While I profess in the strongest terms to confide in the lancet as the first and chief remedy, I would not pretermitt any mention of leeches, which, as a secondary and subservient prescription, will be found of the greatest utility in the management of the cases. They should be freely employed, by scattering them over the parts of the abdomen most affected with pain and soreness. Cataplasms and warm fomentations may be advantageously used after the removal of the leeches, and the bowels should be well evacuated by means of enemata, or by doses of calomel and castor oil, to be followed, after the operation, by doses of calomel and opium, or calomel and Dover's powder, with warm mucilaginous drinks. These serve, after the evacuation of the bowels, to promote perspiration, which, when properly excited or produced, counteracts, in an eminently useful manner, the internal disorders of the circulation.

So great is the influence exerted by peritonitis upon the sanguiferous apparatus, that even where we succeed in effecting a most hopeful and flattering reduction of the pulse by a first bleeding, the blood-vessels soon come to be excited again, and the torrent of the circulation resumes its violence in an hour, or even less. Such a reaction should be met and quelled by repetition of the bleeding again and again, until it is deemed no longer

needful or safe to abstract blood. When the power of the heart's contraction is sufficiently abated to cause it to propel its blood into the aorta with a gentler and more healthful momentum, the capillaries, which are the seats of the inflammation, will become capable of throwing off the masses of blood which have oppressed them, and the constitutional disorders that arose from, and then progressed, *pari passu* with the peritonic irritation, will subside as it subsides, and disappear with its removal.

There are no considerations relative to the treatment of puerperal fever, that I regard as claiming to be compared in importance with those that concern the use of blood-letting; yet, as it is not possible for me to give, in this small work, my views, and the reasons for them, at full length, I shall say no more here upon the use of the principal remedy—but I shall go now to the explanation of some circumstances which I think deserving of the reflections of the student, and the most careful observation of the practitioner.

One of the early symptoms of a peritonitis is flatulent distention of the bowels, or tympanitis. It is a source of infinite mischief, and very difficult of removal. Tympanitis consists in inflation of the intestinal tube, and not in the inflation of the peritoneal sac, as some are inclined to suppose. The air of which the swelling is composed, is extricated from the food or drinks of the patient while in a state of fermentation—a fermentation that could not exist except where the digestive force is impaired, but which force is necessarily impaired where the pulse is at 130 or 140, and where the alimentary tube is invested by a peritoneal coat—already in prey to an active inflammatory disease. But not only is the digestive force greatly impaired,—the alimentary tube, whose outer investment consists of peritoneum, refuses to contract; the gases that are developed, simply distend portions of the tube, whose muscular fibres, like all muscles whose integuments are inflamed, either refuse to act, or act so feebly as to suffer the canal to be inflated, or completely blown up, like a bladder, with the gases of the bowels. In a puerperal woman with peritoneal fever, it is not uncommon to find the abdomen as large as

at the seventh or eighth month of gestation, from inflation of the bowels. They become so tense with the tympany, as to resound upon percussion like a drum. They in this state prevent, in a measure, the play of the diaphragm, whose concavity is at the same time lined with an inflamed peritoneum, that in a degree cripples its power, and the patient soon begins, on these accounts, to have dyspnoea, with panting respiration, while the capillary system of the whole intestinal canal, which is put upon the extremest stretch and tension, grows rapidly less and less able to get rid of its load of blood by any other process than effusion. I have seen some women dying with child-bed fever, who sunk rapidly, and evidently more rapidly, from the great degree of irritation occasioned by the tympanitic distention of the bowels—their respiration being not dissimilar from that occasioned by hydrothorax.

In all febrile affections, a tympanitic distention of the alimentary canal is greatly to be deprecated, and in none more than that of which we are speaking. In peritonitis it adds new dangers to those which are already so imminent, and should be carefully obviated by proper remedies. Now, it may be said that there could be no tympanitis in a case in which the peristaltic fibres of the bowels should continue in the regular exercise of their functions: but where a tract of the jejunum or colon is fully inflated, there is for the time being a total suspension of the peristaltic movement of the muscular fibres of the tube; they being in a quasi state of paralysis, or inaction at least, so as to permit the extricated gases of the canal to inflate it. In order to obviate this evil, we are obliged to make use of aperient medicines, or even purgative doses, to stimulate the peristaltic fibres into a degree of activity sufficiently great to enable them to exclude or pass onwards the gases with which they are distended. For this end calomel and opium, followed by moderate doses of oil, are highly appropriate—or we can rely on doses of infusum rhei, with addition of small portions of potash or soda—or magnesia with mintwater—or a solution of manna, with addition of magnesia and oil of anise seed.

I have on many occasions found the introduction of a catheter into the rectum capable of drawing off the whole of the air of the tympany. Very recently a distressing tension of the abdomen, after delivery by the Cesarian operation, was suddenly and completely relieved by the introduction of a female catheter a few inches into the rectum. The bowel had not power to overcome the sphincterian contraction, and the patient was inflated in consequence; the catheter, when passed above the spincter, permitted the gas to rush out of the tube with a hissing noise. It is an excellent resource, unattended with pain or the least inconvenience.

I am far from desiring to be considered as in favour of very active purging as a remedy in peritonitis. It would be obviously improper to enter upon the management of a case of the malady without procuring a sufficient evacuation of the fæculencies that are generally accumulated in the bowels of lying-in women: that should be always attended to, and when the physician is satisfied that they have been removed, he should abstain, as a general rule, from the use of strong purges; but if the tympanitic state of the patient requires it, he should by no means withhold the aperient medicines which have been recommended.

It is frequently found, that, even in those cases where we feel assured the peritonitis has received, by the lancet and other means, an effectual check; where the pain is all gone, and even the soreness removed, the patient continues to have fever, which may last many days. Under these circumstances the use of James's powder, or the golden sulphur of antimony, combined with nitre and calomel, is of the greatest value. These medicines very generally give rise to copious diaphoresis, which may be maintained by draughts of warm herb tea, such as the balm, or sage, or by copious draughts of barley-water, and a careful adjustment of the bed-clothes to the condition or circumstances of the patient.

During the whole period characterised by active inflammatory symptoms, the diet ought to consist of barley-water, very thin gruel, or arrow-root, and such like

articles. A greater degree of indulgence may be allowed after the fever has quite disappeared.

Rest, in a recumbent posture, is one of the essentials of the successful management of the case. The nurses should be forbidden to raise up the patient even in bed—for if an early getting up from bed may serve as the exciting cause of the disorder, it would surely be very dangerous to get into a vertical or sitting posture while the inflammation is in full activity.

For the most part, the lacteal glands do not secrete much milk in women in peritoneal fevers. It is always a salutary sign when the breast continues to be full under this disorder.

The lochial discharges are also very much diminished, and sometimes wholly disappear during the greatest intensity of the malady. Tepid vaginal injections of mucilage of flax seed, or of milk and water, may be with prospect of benefit made use of, where the patient can bear so much handling. The discharges which are checked or suspended during the onset and greatest violence of the complaint, reappear upon its decline or cessation.

Blisters are held as favourite applications in puerperal fever. I doubt not they may in proper circumstances contribute greatly to the safer and more speedy cure of the inflammation; but I think I have seen blisters applied too soon in some cases, and I have reason to suppose, that if not properly timed, they are capable of adding to, instead of diminishing, the constitutional disturbance, already too great. If applied very early they increase the fever and irritation, and continue to be in the way of other more useful remedies; they confound the diagnosis—which should be often repeated—by rendering the practitioner unable to discriminate between the pain produced by the cantharides and that arising from the internal disorder, which is greatly to be deprecated, since his opinion and practice in the case should be very much governed by the degree of pain—as it is in pleuritis. A blister, applied after a due reduction of the force of the circulation, and an ascertained diminution of the pain and soreness of the belly, may happily bring about a resolution in cases which, but for

the well-timed prescription of such a remedy, might end in a fatal effusion.

I do not think that the malady is at all disposed to result in gangrene or mortification. The affected parts are too important and too numerous to be the subjects of such terminations; the patient dies before they can be effected. The adhesive inflammation is found to have exerted its salutary power in some of the samples; but the adhesions are very partial, the far larger portion of the membrane having poured out vast quantities of a sero-puriform liquid, containing a great abundance of flaky matter, which appears to consist of coagulated albumen, and which is found floating in the fluid contained in the peritoneum, or adhering like a croup membrane to the peritoneal surface of the bowels, liver, stomach, &c.

A woman who labours under an acute peritoneal fever, is generally found lying on the back, with the knees drawn up; the hands are rarely to be seen crossed on the abdomen—they are laid by her side, across the breast, or they are employed in holding up the bed-clothes, whose weight is apt to give pain if pressed on the belly. Every attempt to put down the legs, and to draw them up again, or to rotate the legs, is productive of pain, because there is implied in such motions a contraction of the *psoæ* and *illiacæ internæ* muscles, as well as the *rectus* and *oblique* muscles of the belly; but the contraction of any one of these muscles occasions a change of relation of parts of the inflamed peritoneum. The woman therefore moves unwillingly. She lies remarkably still, and if affected with jactitation and restlessness, she expresses it only by flinging her arms about, and by frequent rotations of the head. She always endeavours to keep the abdomen and lower limbs quiet; for she knows that every movement of them is distressingly painful. Hence the mere *decubitus* is important as a diagnostic sign.

To find an improvement in the patient's ability to move herself, with a corresponding improvement in the circulation, is of the most favourable augury; but to observe the pulse increasing in frequency while it also becomes more feeble, with diminished heat of the members and augmented heat of the body, to discover a disposition to

singultus, with an eructation of fluids into the mouth, an anxious expression of countenance, high and frequent respiration, with increased ability to move the legs, and diminished pain on pressure, are all indicative of the cessation of inflammation of the peritoneum; but it has ceased not by resolution, or a return to health—it has come to one of its natural terms in effusion. The inflammation is at an end, and the patient begins to die. It would seem that the forces of the living economy have exhausted themselves in the struggle with a malady, which, though they conquer it at last, yet are themselves destroyed in the moment of victory. There soon comes on a vomiting, or rather a violent eructation or gurgitation of dark-looking fluid; the patient mutters, she picks the bed-clothes, she clutches at *muscæ volitantes*, the diaphragm labours to carry on in vain the work of respiration, the hands and feet acquire a livid hue, and are clammy, the pulse becomes a thread, it ceases in the wrists, and she dies, probably in the act of regurgitating from the stomach the last draughts which the anxious hand of friendship or love has tendered as a solace or a hope. It is altogether a most melancholy scene, for, connected with all the moral distress which such a fatality lavishes on relatives and friends, there is generally a sharper pang for the hapless infant, which, deprived, at the moment of opening its eyes on the great theatre of the world, of the needful help of its mother, is destined to bear for years the bitter fruits of her death. There is scarcely a case of disease terminating in the decease of the patient which produces such a general sympathy as this, and indeed all those which occasion the loss of patients in child-bed.

I am very sensible that I have made but a slight sketch of puerperal fever—it is a subject that could be better discussed in a volume than in a few pages, but I preferred saying a few words upon the subject, even at the risk of making a very meagre article, if I could, by means of it, bear my testimony against every doctrine which shall teach that this most acute, extensive and dangerous inflammation is to be combatted by any means short of the most signal and active of those which are called antiphlogistic.

CHAPTER XIX.

OF ATRESIA.

I AM desirous of recording the few remarks that will be found under this title, on account of their intrinsic interest.

A lady, from a distant part of the country, came to the city last spring (1837), in order to consult Dr Randolph, who was good enough to invite me to see the patient with him. Her story was as follows: More than two years have elapsed since she gave birth to a healthy child; the labour was extremely rapid; inso-much, indeed, that the infant was born before the physician could reach the house. The after-birth did not come away for an hour, during which time there was flooding. It was at length removed by force. The lady became very weak. In a few days she was attacked with inflammation of the vagina, accompanied with enormous discharges of matter, and great thick pieces of flesh, to use her own account. She was never examined by her physician, who, however, directed washes, injections, &c. &c. After a long and exhausting hectic, attended with extreme emaciation, her discharges grew less copious, and she gradually, at the end of some months, got well. There was, however, no vagina, not even a cul de sac; there was simply the genital fissure. Of course, no catamenia could appear; but, after several months of good health, she be-

gan to complain of pain or *misery* in the hypogastric and pelvic regions. The pains recurred with periods of a month, and having at length become intolerable, she found her health declining, and came, as before said, to consult that able and eminent surgeon, Dr Randolph.

There was a tumor in the hypogastrium, which reached half-way up to the navel; it was of a firm and resisting feel, not unlike a contracted womb soon after delivery. As there was no vagina, the finger was passed into the rectum, where it came in contact with the same tumor, which seemed to occupy the excavation as it is occupied by a child's head, filling the cavity entirely. Upon separating the labia, there was nothing but the genital fissure; there was no way for a common probe to pass upwards. A sound was introduced into the bladder, and retained there until a finger was also introduced into the rectum: the only texture that separated the finger and the sound seemed to be, upon careful examination, the walls of the urethra and the coat of the bowel; there was no vagina to be felt. Hence Dr Randolph and I agreed in opinion, that the vagina had been wholly destroyed by the sloughing process which took place shortly after her confinement. We entertained no doubt as to the nature of the tumor that occupied the pelvis and lower part of the abdomen: it was the womb hermetically sealed, and retaining in its cavity the accumulated menstruations of nearly two entire years.

After much diligent search, we were unable to discover the cervix, or os uteri; but we supposed they might possibly be turned upwards towards the top of the pubis, so as to elude any investigation made through the rectum alone, the only possible way of making research. No vestige of a vagina was discoverable by the taxis; nevertheless, supposing it possible that the whole tube might not have been destroyed, and that possibly its upper extremity might be reached by the bistoury, Dr Randolph operated with a view to make an artificial vagina, and haply to discover the remainder, if any, of the original one.

Introducing a strong metal staff, slightly curved, into

the bladder, he took his seat in front of the patient, who laid on her back, with the knees drawn up and separated. I held the staff firmly, while with the fore finger of his left hand, in the rectum, to serve as a guide, he dissected, by horizontal strokes of the bistoury, betwixt the rectum and urethra, and carried his incisions up very nearly to the substance of the womb itself, without having wounded either the rectum or the urethra: when he had completed his incisions, the whole finger could be passed upwards to the bottom of the cul de sac he had formed by so skilful and accurate a use of the bistoury.

In consequence of our uncertainty relative to the situation of the os uteri, and from his having successfully removed so considerable a portion of the barrier which opposed the escape of the contents of the uterus, Dr R. suspended his operation at this point.

It was resolved to keep the passage open by the use of a bougie, made as light as possible, and of a size sufficiently large; the bougie was made of gilt silver, about four inches in length, and as large as the thumb, its weight not more than two drachms. We indulged a hope that by using this bougie a few months, the progress of the case would be such as to bring the os uteri to the extremity of the instrument, by means of the increasing expansion of the uterine globe, and that the contents of the womb would discharge themselves into the artificial vagina, or that they might be discharged by a future incision. The lady returned to her own country, and after an absence of three months came back to the city, still suffering under the same misery, with an increased magnitude of the uterus, but without having had any discharge from the vagina. She had constantly worn the bougie. Upon examination, we found that the vagina was now covered by a smooth surface, resembling a mucous membrane; the upper end of the bougie, when withdrawn, was covered with a sort of muco purulent matter, tinged with blood. The sufferings of the patient from the distension of the womb were very great, and it was agreed to puncture the organ in order to draw off its contents. On the 8th day of July, 1837, Dr Randolph and Dr R. M. Huston, who had been in-

vited by us to witness the operation, met me at the lodgings of the patient.

The tumour, felt through the vagina, was hard and resisting, as an enlarged ovarium; it was softer and the walls thinner when examined through the rectum. At Dr Randolph's request I now made use of a curved trocar, enclosed in a canula, in order to puncture the womb. The trocar was about five inches in length, and of the size of a small writing-quill. The patient was laid on her back near the edge of the bed; I introduced the forefinger of the left hand into the rectum, and having directed the end of the finger to a part of the tumor that felt most yielding, I carried the point of the trocar along that finger, and having given it a direction as nearly as possible perpendicular to the surface of the tumor, pushed it through the resisting tissue until I found it had freely entered the cavity; the trocar was now withdrawn, leaving the canula in place. There issued from the open end of the tube a dark red viscous substance, without odour, of the consistence of meconium, and as adhesive as that substance. The puncture was scarcely felt. In twenty-four hours, during which the canula was permitted to remain in situ, about twenty-five ounces of this fluid were discharged; the uterine tumour had disappeared from the hypogastrium, and the mass, as felt in the rectum, greatly reduced in size, and was far more moveable. As all the liquid seemed to be now evacuated, the canula was withdrawn: no discharge followed its withdrawal. The patient had no symptoms attributable to the puncture; she rapidly recovered her strength, and left the city with renovated health, and nearly free from the misery which had so long embittered her existence. In the course of about a month after returning to her home, she had a very copious discharge from the vagina, of a fluid of a consistence similar to that which had flowed through the canula, but of a whitish colour, after which her health greatly improved. I have recently learned that she has not yet menstruated.

Should the womb again become distended, she may again be relieved by the trocar. Circumstances alone

could determine whether a new puncture should be made from the upper end of the vagina or through the rectum, as at first.

We have considered it possible that even a part of the womb itself might have sloughed away at the time the vagina was destroyed.

NOTE.—*Dec. 14, 1837.* On Tuesday, the 12th inst., the patient, while on her way to the city, for the purpose of further advice, discharged from the vagina about twenty-five ounces of a substance in all respects similar to that which passed off when I used the trocar to puncture the womb. The discharge has now ceased, and she is quite free from pain, or any inconvenience, or disorder of her health.

CHAPTER XX.

MORBUS CÆRULEUS OF INFANTS.

I FEEL desirous of recording, in this place, a few observations relative to the affection of new born infants, usually termed blue disease, and which is well known to arise from an incomplete state of the septum of the auricles of the heart.

At the fifth month of gestation, the two auricles constitute nearly a common cavity, in consequence of the septum auricularum being so little developed at that early stage of existence. With the progress of the pregnancy, the septum becomes daily more and more complete, through the sixth, seventh, eighth and ninth months, until, at term, the foramen ovale is supposed to be nearly, if not wholly, closed up. In many children that at first present slight appearances of asphixia, but subsequently prove to be very thriving, I have supposed the septum to have been at birth not sufficiently closed, but to have been completed within a week or two after birth. Not a few cases, however, will be met with in a large practice, where the asphixia is followed by the death of the patient, within a few days after its first seeing the light. These are mostly instances in which the child never does acquire a healthy tint of the skin, from its first cry until its death.

It does not follow, that because the foramen ovale is open, the patient must always present the evidences of

an imperfect pulmonary circulation. I have seen several instances in which the child was apparently perfect, being ruddy, contented and thrifty as could be desired, but which, nevertheless proved, after several days, to be samples of morbus cœruleus of a fatal kind. It appears to me, therefore, that the foramen ovale is, in some, considerably open, although the subject gives no evidence of it by a blue colour of the skin, or any signs of a want of oxygenation of the blood.

If a child be kept very quiet, its wants well understood and attended to, it is capable of carrying on the pulmonary and systemic circulation perfectly well, notwithstanding an open foramen ovale; whereas, if it be neglected, or allowed to fall into a great passion and violent crying fits, the blood begins to find its way through the foramen ovale into the left auricle, to such an amount as in a few days to destroy it.

Without having kept any record, I think I may venture to say, that I have seen from twenty-five to thirty cases of morbus cœruleus; cases fully deserving that appellation. And that a still greater number of infants have fallen under my notice, in which a slight blueness about the mouth, and in the hands and feet, have induced me to suppose that a part of the blood was still transferred from the right auricle directly into the left one, but not to such an amount as to produce any serious disturbance of the child's health or comfort. The new born child can bear, without great difficulty, a degree of asphixia which would be highly distressing, if not fatal, for an adult. The blood, with which it has been enabled to grow and thrive up to the period of its birth, is, essentially, a black blood, and the mere fact of the establishment of its respiratory in place of the placental mode of oxygenation, does not imply any necessity for so complete a process of oxygenation as is demanded for a more advanced state of its organization and functions. I am, by the above reasons, induced to believe that, in new born children generally, the foramen ovale is somewhat open: I do not, in fact, remember to have seen a very young subject dissected, in which it was not open.

In those cases, in which a very large part of the blood continues to pass through the foramen ovale after birth, the child becomes blue, and sleepy, and dull—is affected with irregular respiration—sometimes breathing very slow, and at others very fast, and sooner or later is affected with spasms, and even with convulsions, which are apt to come on when it cries or is disturbed. If left quiet and asleep, the colour soon assumes a more favourable appearance, so that hopes of its recovery are entertained, until, upon some motion in dressing or nursing it, the heart's action again becomes irregular, the lungs are engorged, and the blueness becomes more and more intense and permanent, until convulsions at length put an end to its distress, with its life.

I had seen many infants perish in this manner, and knew of no mode of treatment presenting a reasonable prospect of success. About two years ago I, however, treated a case successfully, and have since met with two other instances, in which the same method was followed by a similar fortunate event.

The child was three or four days old—a female, which had been perfectly well since its birth. I was called to see it, and found it blue, gasping for breath, nearly pulseless, and affected with frequent spasms. It had been taken out of the mother's room, in order that she might not see it die—for to all appearance it was in a dying state, and seemed unlikely to live for half an hour. Upon judging that all its symptoms depended upon the transmission of blood through the septal foramen, I at once reflected on the theory of the circulation, advocated by Sæmmering, and resolved to place the child in such a position as would most favour the transit of the blood along the iter ad ventriculum, and oppose its escape through the foramen ovale.

Having adjusted some pillows and laid the child upon them, on its right side—the body inclined at an angle of 30 degrees, I ordered the nurse not to move it from the position in which I placed it, for many hours. My hope was, that by laying the infant on its right side, and maintaining the heart in such an attitude, the left auricle would be perpendicularly above the right

one, and that the effect of gravity alone on the blood would gradually operate in such a manner as to allow it to flow off into the ventricle, instead of finding its way to the systemic auricle.

Let the student reflect on the probable effect of such a position of the heart, continued for some hours, and I think he will concur with me in the opinion, that the mode of treatment was at least founded upon a rational theory, and that is was better than to attempt to relieve the patient without any plan or principle for my guidance.

The child was left upon its side for six hours ; at the end of that time the convulsions had ceased, the healthy hue of the skin was restored, and every trace of the asphyxia *had* totally disappeared. The child got perfectly well, and is now quite healthy.

The next case that I saw was a very small child, which was feeble at its birth, but did not present any appearances of asphyxia for several days subsequent to its birth. I was called to it in haste, and it was so ill, that several persons in the room who were about it after my arrival agreed with me that it was dying. I did not think it could, at one time, survive for ten minutes—it was blue, it gasped, it had no pulse at the wrist, and the interval of the respirations was so great that we once supposed it had entirely ceased to breathe. I resolved to place it upon its right side, as had been done in the first case—the pillows being inclined so as to keep it at an angle of about 30 degrees to the horizon. It was ordered to be left in that posture for several hours, and as there seemed to be a great engorgement of the thoracic contents, I requested the nurse to have one American leech applied to the region of the heart. My directions were very fully complied with, and in a short time there was an amendment in the breathing and pulse—the asphyxia hue of the skin gave place to a natural colour, and the child recovered. He is at present a remarkable specimen of the most vigorous health.

The third case was that of an infant born at eight and a-half months old ; the mother being at the time ill with a violent dysentery. The child moaned a good deal

immediately after its birth, as seven months' children generally do, but it appeared to do very well for a few days, so that my attention was not specially called to it by the monthly nurse. It was a week old when I was called upon to see it, with information that it was dying.

I am very confident that no physician would have formed any other conclusion than that at which I arrived, upon seeing the infant—it appeared so far gone, that there was not the least expectation that it could recover. Nevertheless, I placed it in the inclined position, and on the right side—directed a leech to be put on the region of the heart, and told the nurse not to move it for six hours. The child recovered, and is now in excellent health.

These are three successful cases which have been noticed within about two years. I have made use of the inclined position on the right side for two other children, one of which was born at seven months and a-half. Both of them died.

I have, with great deference for the judgment of my brethren, ventured to make the above relation of a kind of organic imperfection, which usually admits of no rational treatment; and I am not fully prepared to say, that the successful results of the three cases are to be confidently assigned to the position in which the children were placed, though I am strongly inclined to believe that, had they been laid on the left side, or had they continued to lie on the nurse's lap or in her arms, subject to be jolted and disturbed with every one of her movements, I should not have enjoyed the pleasure of seeing these infants recover. I very sincerely hope that some of my medical brethren will try the same method of treatment in the cases that may fall under their care, and if any success should follow, that they will make it known to the medical public, inasmuch as it is a subject in which any practitioner of midwifery must feel strongly interested, on account of the generally fatal consequences of all the severe cases under the ordinary modes of managing them.

I shall not close this article without mentioning the case of a new-born child, about twelve hours old—it

was very small and thin. The father, who was a medical gentleman, told me he had never been able to feel any pulse in its wrists. It was dying with asphixia; it expired very shortly after I saw it, and the body was examined. Upon a careful investigation, the auricles, with the septum, were perfectly formed; but the ventricles were without any septum at all, so that they formed a single large ventricle, which gave origin to the pulmonary artery at one point, and at another to the aorta.

THE END.

