

can be assigned for their production, the presumption becomes so well supported as almost to be called a moral certainty. A person of experience, who is familiar with all these signs, and with the others produced by disease which resemble them, will

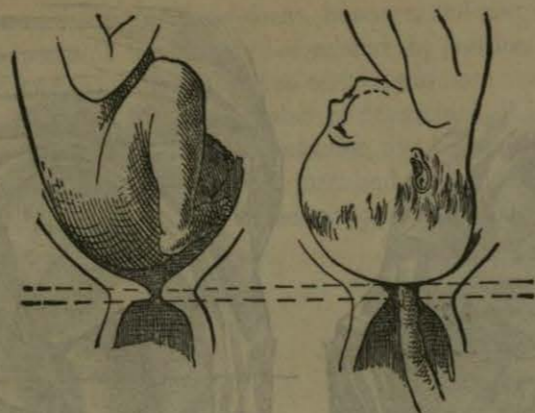


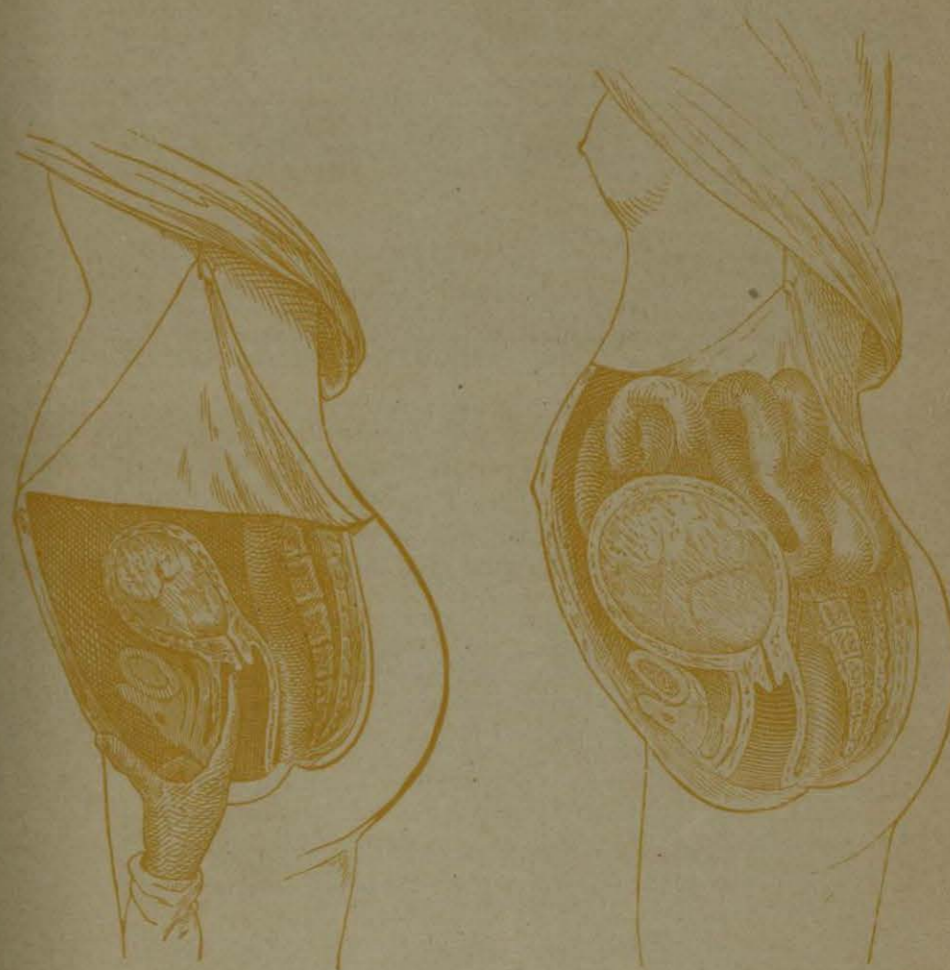
FIGURE 100.

The neck of the womb, at near the end of nine months in a primipara.

The neck of the womb, at near the end of nine months, in a woman who has previously borne children.

seldom find it difficult to decide; but still there are cases in which pregnancy proceeds, even to its termination, with but few unusual symptoms, so that both patient and attendant are completely at fault. This, however, is very rare, and many eminent authors contend that it is *always* possible to detect pregnancy, *after the sixth month*, and I think so myself, unless the child be dead, in which case it will soon be evident in another way.

PLATE XXXVIII.



The Impregnated Womb in a First Pregnancy; at 4 Months, and at 5 Months.

CHAPTER LXIII.

FORM AND SIZE OF THE FETUS AT FULL TERM.

Size and Form of the Body.

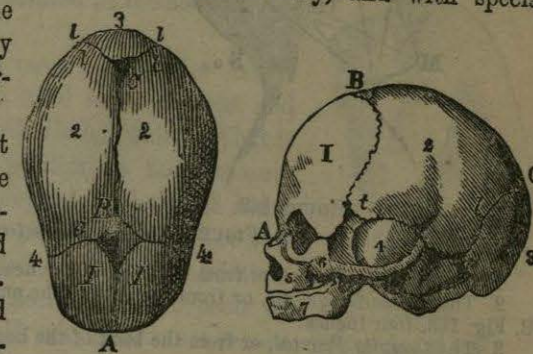
THE average length of the fœtus, at full term, is about twelve inches from the head to the breech, and about eighteen inches from the head to the feet. Its weight varies from five to eight pounds, perhaps averaging about six, though some have been born weighing only three pounds, or less, and some even as high as fifteen. The breadth across the shoulders is about four inches, and the same across the hips, but both are so easily compressed that during delivery they only measure about three inches, or three and a half at most.

SIZE AND FORM OF THE HEAD.

The head is the most important part, because it is the largest, and usually presents first. It is therefore necessary to describe it fully, and with special reference to its importance in the early stages of labor, as the part by which the position is usually determined.

The bones of the cranium are not closed together, as they are in the adult, but are separated to a considerable distance, in certain parts, and connected by a strong membrane. These membranous spaces are called *sutures* and *fontanelles*, and a knowledge of them is absolutely necessary, as a means of ascertaining the position of the head.

The Sutures.—The first of these spaces, which extends from the lowest part of the middle of the forehead to the occipital bone, is called the *sagittal suture*, or antero-posterior suture. It separates the two frontal, and the two parietal bones. The spaces between the two frontal and the two parietal bones are called the *frontal parietal sutures*, and those between the two parietal bones and the occipital, are called the *lambdoidal sutures*.



FIGURES 161-2.—*The Fœtal Head.*

The head is generally divided into the cranium, or that part which contains the brain, and the face.

The Bones of the Cranium.—These are seven in number, viz., two *frontal* bones, or those forming the forehead, 1, 1, Figs. 161 and 162.—Two *parietal* bones, or those forming the sides of the head, 2, 2, Figs. 161 and 162.—The *occipital* bone, or that forming the back of the head, 3, 3, Figs. 161 and 162.—And two *temporal* bones, which lie over and between the ear and the eye, 4, Fig. 162.

The Bones of the Face.—These are five in number, viz., two *superior maxillary*, or upper jaw bones, 5, Fig. 162.—Two *malar*, or cheek bones, 6, Fig. 162.—And one *inferior maxillary*, or lower jaw bone, 7, Fig. 162. The sutures and fontanelles can be seen where the different bones join each other.

The Fontanelles.—When the different sutures meet at a point, the membranous space is greater than at other parts, and is called a fontanelle. Thus where the two frontal parietal sutures meet the sagittal suture, there is quite a large diamond-shaped space between the different bones, filled up with membrane. This is called the *anterior fontanelle*, or bregma—B, Figures 161, 162. Where the sagittal suture joins the two lambdoidal, there is another space, not so large, and different in shape, being triangular; this is called the *posterior fontanelle*—C, Figures 161, 162. And where each of the temporal bones joins the parietal, there are two other spaces, called the *temporal fontanelles*, which are also irregularly diamond shaped, but not nearly so large as the anterior fontanelle—D, Figure 161.

It is evident that if a person can distinguish these fontanelles, when he touches them with his finger, he can tell what part of the head is presenting, and hence their use.

These spaces allow of the bones lapping over each other, during delivery, and thus the head is made smaller. They do not disappear till some time after birth, and in very young children the brain may be felt, and seen to work, at the anterior fontanelle. Eventually however, the bones come close together, and are joined by a

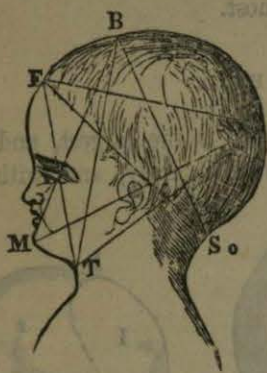


FIGURE 163.

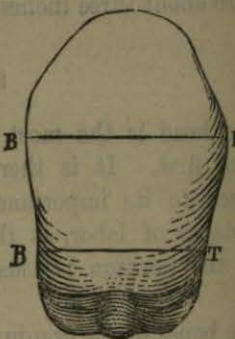


FIGURE 164.

FIGURES 163-4. *Diameters of the Head.*

1. The *Occipito Mental*, or from the back of the head to the chin, M, O, Fig. 163, five inches.
2. The *Mento Bregmatic*, or from the chin to the anterior fontanelle at the top of the head, M, B, Fig. 163, four inches.
3. The *Occipito Frontal*, or from the back of the head to the top of the forehead, O, F, Fig. 163, four inches.
4. The *Trachelo Occipital*, or from the throat to the back of the head, T, O, Fig. 163, four inches.
5. The *Sub Occipito Bregmatic*, or from the nape of the neck to the top of the head, S, B, Fig. 163, three inches and a half.
6. The *Trachelo Bregmatic*, or from the top of the throat to the top of the head, T, B, Fig. 163, about three inches and a half.
7. The *Trachelo Frontal*, or from the top of the throat to the top of the forehead, T, F, Fig. 163, about three inches.
8. The *Sub Occipito Frontal*, or from the nape of the neck to the top of the forehead, S, F, Fig. 163, about three inches.
9. The *Bi Parietal*, or across the head from one side to the other at the middle of the parietal bones, the widest part, B, P, Fig. 164, three inches and a quarter to three and a half.
10. The *Bi Temporal*, or across the head from one temporal bone to the other, B, T, Fig. 164, about two inches and a half.

curious kind of dovetailing. The two frontal bones, however, completely coalesce, and form but one, in the adult.

Sometimes the bones will be very perfectly formed, and the fontanelles nearly filled up, before birth, and then the head cannot be crushed much smaller, which

causes the labor to become both painful and difficult. This is usually called an ossified, or solid head.

Diameters of the Head.—The diameters of the head are the distances between its most prominent points. They are necessary to be known before we can judge as to the possibility of its passing the straits of the pelvis, in the various positions.

Generally there are reckoned *ten* diameters, and they are represented in the Figures on the preceding page.

The necessity for knowing these diameters will be obvious. It is only by being acquainted with them, and with the straits of the pelvis already described, that we can tell whether the child can pass or not in certain positions, and how we must change its position, when possible, to give relief.

On comparing the diameters of the head with those of the pelvis, it will be seen that some of them correspond in size while others do not, so that in one position delivery can take place spontaneously, while in another it will be difficult, and in some nearly impossible, without assistance. Thus, for instance, if the head should present by the occipito mental diameter (O, M, Fig. 163), it evidently could not pass while in that position, because by this diameter it is five inches in width, and the greatest diameter of the pelvis is only about four inches and a half. Its position must therefore be changed, and the accoucheur must know how to change it with advantage.

ATTITUDE OF THE FŒTUS AT FULL TERM.

The attitude of the fœtus is represented in the accompanying figure :

The position in which the fœtus most usually lies in the womb has already been shown. The head is downwards, and the back part of it turned to the mother's left side. What is the cause of this almost universal position is not certainly known. It was formerly thought to depend on the head being heavier than the other parts, and thus sinking down; but this supposition has been shown to be entirely without foundation. M. P. Dubois has lately advanced the notion that it depends on an instinctive feeling in the fœtus itself, which directs it to take that position by which it can most easily make its exit. This opinion appears very reasonable, and is apparently well founded. It is well known that the fœtus is susceptible of various impressions while in the womb, and is impelled by unerring instinct to take the breast immediately it is born; nay, it has even been known to suck the finger of the assistant, in cases of face presentation, even before birth! We can readily believe, therefore, that it is directed to place itself in the womb in the best position, the same as it is directed to take the finger in its mouth.

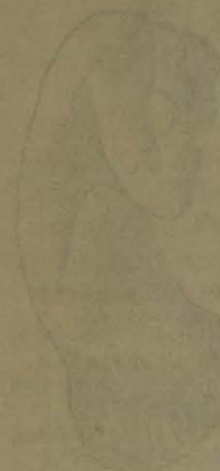
In the young of many of the lower animals this is also strikingly exemplified. The young duck in the shell taps with its little beak against the part that is to be broken, and rushes into the water even with a part of the shell still on its back. The young opossums, who are born imperfect from the womb, shelter themselves, immediately they come into the world, in the pouch on their

FIGURE 165.—*Attitude of the Fœtus.*

The arms, it will be seen, are crossed on the breast, upon which the chin is also bent; the thighs are close together, and brought against the abdomen; the legs are close bent on the thighs, and the feet are turned up against the front of the legs, the whole body being curved forward.

mother's breast, and fasten themselves to the mammæ till they are more perfectly grown.

It must be remarked, however, that the head does not *always* present first, though it usually does so. Occasionally we have the breech present, and still rarer even other parts; but these are merely exceptional deviations, the causes of which are unknown. Out of every sixteen children born, *fifteen* usually come head first. This, however, will be shown better further on.



CHAPTER LXIV.

THE APPENDAGES OF THE FŒTUS AT TERM.

The Membranes.

THE uses and arrangements of the membranes surrounding the fœtus have already been explained, so that little more is needed to be said here, because they are not much different at the full term from what they are at an earlier period, excepting perhaps that the *amnion* is a little more dense and firm. This membrane appears not only to surround the fœtus like a bag, to contain the waters, but is also reflected close on to its body, like its skin, with which in fact it is thought by some to be connected. The child is certainly born with this membrane still on its body, and does not part with it till some days after birth, when it peels off like a thin dead skin, or powder.

The *waters* inclosed within the amnion have now increased to their greatest quantity; and there is also, in most cases, a second body of fluid between the amnion and the chorion, which, coming away before the real discharge, is called the *false waters*.

The quantity of the true waters, at birth, is about twenty, or from that to thirty ounces, but is very variable. It is of a greenish color, rather muddy, and heavier than water. It contains albumen (white of egg), sulphate of soda, and lime. Ninety-eight per cent. of it, however, is pure water. It appears to be excreted, like perspiration, from the surface of the membranes, and most likely is merely the watery portion of the blood exuded through. The uses of this fluid are various. As already stated, it probably supplies some nutriment to the fœtus, which it also protects, in a great measure, from pressure and from concussions. It also prevents the limbs from adhering, and helps to distend the mouth of the womb, in the earlier stages of labor, besides affording an abundant slippery fluid for the purpose of lubricating the parts, thus making the passage of the child more easy.

The other two membranes, the chorion and decidua, are not of much importance in our present explanation; and practically, in fact, the whole three may be regarded as *one envelope*, surrounding the child and the waters in which it floats.

THE PLACENTA.

At the full term, the placenta is about six or seven inches in diameter, and nearly circular, though often irregular. Its thickness varies from one to two inches, and is greatest where the cord is inserted. Sometimes it is very large, or very thick, and may then be difficult to extract, and even cause serious accidents.

As already explained, the placenta is composed of a mass of blood-vessels, by means of which the blood of the fœtus is, in some way, brought into contact, or com-

mingled with that of the mother. Its uterine face is irregular, being broken into lobes, or cotyledons, on which may be seen a vast number of little veins and arteries, corresponding with others on the inner surface of the womb. Its outer surface is of a gray red color, and covered with the foetal membranes, under which the large blood-vessels can be traced. The placenta is usually attached to one side of the uterus, near the fundus, or at the fundus, but sometimes it grows wholly or in part over the mouth of the womb; an occurrence which may cause serious consequences.

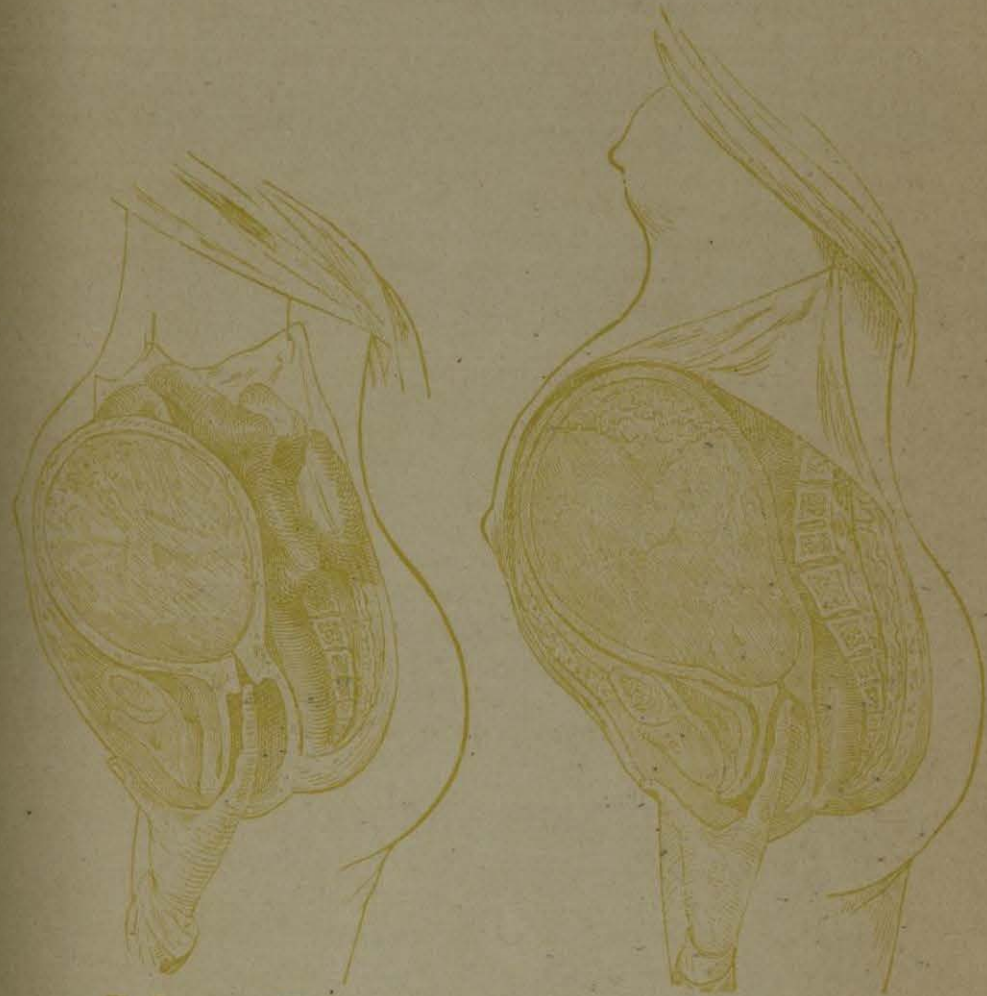
When there is more than one child, each usually has a separate placenta, and they are all intimately connected. In some rare cases, however, one placenta only exists with twins. Each child has also a separate amnion, and waters; but there may be only one chorion and decidua for the whole, or each may have a complete set of membranes itself. Instances have been known, however, of two children being inclosed in the same amnion, and surrounded by the same waters, having but one placenta between them.

These possible diversities show the accoucheur how necessary it is for him, in any case of multiple pregnancy, to be sure that he has abstracted *all* the after-birth; and they also caution him not to proceed to unnecessary manipulations merely because it is not the same as in other cases.

THE UMBILICAL CORD.

This is composed, as already stated, of an artery and two veins, which twist round the artery, like the strands of a rope. These are all inclosed in a sheath, and surrounded by a thick kind of mucus, called the *Gelatine of Wharton*. Its thickness is about that of the little finger, though it may be much larger, having been seen as thick as the child's body. Its usual length is about eighteen or twenty inches, but it has measured as much as five feet. Then again it has been found so small that the vessels in it could not nourish the child. These exceptional variations, however, are very rare. The veins may also be enlarged, or full of knots, and the circulation may be so much impeded thereby as to cause abortion. The various accidents which may result from anomalies in the cord will, however, engage our attention in another place.

PLATE XXXIX.



The Impregnated Womb in a First Pregnancy; at 8 Months, and at 9 Months.

CHAPTER LXV.

PRESENTATIONS AND POSITIONS OF THE FETUS.

The child may present several different parts of its body at the commencement of delivery, and they may be in different positions relatively to the different parts of the pelvis. All these require to be known.

Different authors have made different classifications of the presentations and positions, and have differently named them; but this is of little consequence, since they are still the same, no matter how they are named. I shall follow the arrangement of M. Chailly, because I think it equally perfect, and much more simple and practical than any other yet proposed.

PRESENTATIONS.

The foetus may present at the mouth of the womb either by the *head*, the most usual way; by the lower extremities, which is the most frequent way after the head; or by various parts of the trunk, which is the least frequent way of all.

In each of these *three* full presentations there may be certain variations, which require to be noticed. The head, for instance, may present either by the *cranium* or by the *face*; the lower part of the body may present either by the *feet*, the *knees*, or the *breech*, according as the legs and thighs are flexed or extended, and the trunk may present either on the *right* or *left* side, and inclined toward the *back* or toward the *chest*, though neither the back nor abdomen ever fully present.

Each of these variations may also have slight variations again. Thus the face may present full, or by one or the other cheek, and so on. These variations, however, are of little practical consequence, because we only find them at the very commencement of the labor, and they always change to the full presentation.

Practically speaking, therefore, there are *five full presentations*, viz., the *cranium*, the *face*, the *breech*, the *feet* or *knees*, and the *trunk*, either by the right or left side.

The *varieties* of these, as already remarked, not requiring any special attention from the accoucheur, providing he is not puzzled or misled by them.

POSITIONS.

The position means the particular direction in which the presenting part of the foetus is placed in relation to the pelvic straits. The pelvis itself is supposed to be divided into two similar halves, the *right* and the *left*, and each presenting part has one particular place, which is referred to as the indicating point. Thus, for instance, in the cranium, the occiput, or behind part of the head, is the indicating point; and we therefore say, in cranium presentations, that it is a *right* or *left occipital*

position, according as the back of the head is to the right or left side of the pelvis. In face presentations, the chin (*mentum*) is the indicating point, and we therefore say it is a *right or left mento position*, according as the chin is toward the right or left side. In breech presentations, the child's sacrum is the indicating point, and we then say it is a *right or left sacral position*, according as the sacrum is toward the right or left side of the pelvis. In trunk presentations, which are always crosswise, the head (*cephalo*) is the indicating point, and we therefore say it is a *right or left cephalo position*, according as the head lies toward the right or left side of the mother's body.

In cranium presentations, also, the back of the head is not merely on the right or left side, but may be at two different points on each side. It may be either nearest to the sacrum (posterior), or nearest to the pubes (anterior), but still against the ilium; it is therefore called a *right or left anterior, or posterior, occipito iliac position*, as the case may be. Sometimes, also, the occiput lodges immediately on the pubis, instead of going to either side, and that is called an *occipito pubic position*; at other times, on the contrary, it is placed against the sacrum, instead of being on either side, and that is called an *occipito sacral position*.

In presentations of the head, therefore, we may reckon *six* positions—the right and left anterior and posterior occipito iliac, and the pubic and sacral.

In presentations of the face the same, they being *mento* iliac, and so on, instead of occipito.

In presentations of the lower extremities also the same, excepting that they are *sacro* iliac, and so on, instead of occipito.

In presentations of the trunk we have but two positions for each side, the right and left cephalo iliac; according as the head is on the right or left side of the mother's body. The child always lying, in presentations of the trunk, crosswise—the feet on one side and the head on the other.

Most authors enumerate many more presentations and positions, but they are of little practical utility. When the head presents, for instance, the delivery takes place in nearly the same manner, let it be in what position it may. And in presentations of the face, or of the lower extremities, the particular position is of little consequence, the delivery being usually effected much the same in them all. Some of the positions are, it is true, much more favorable than others, but a spontaneous delivery, generally speaking, occurs in all of them, when the head, face, or lower extremities present. Very frequently indeed, the less favorable positions are changed to the more favorable ones, and the worst seldom do more than impede delivery for a time, unless there be some malformation, or loss of power. I therefore refer to them more for convenience in future explanations, and to enable my readers to know what is meant by them, when they read other books; not because they are really necessary to be understood, or of any great practical use.

The celebrated Baudelocque admitted *seventy-four positions*, and *twenty-two presentations*; and the number might be made still greater, if all the variations were to be enumerated. Such classifications, however, are more ingenious than useful, and they are but little noticed even by medical men.

I shall merely describe the mechanism of labor in the most frequent positions, in each presentation, because the others usually change into these; and even when they do not, the process of delivery is essentially the same, and also the mode of assisting it.

MODE OF ASCERTAINING THE PRESENTATION AND POSITION.

The Presentation.—Although in general it is not possible to ascertain with certainty what part of the foetus presents to the mouth of the womb, until labor commences, yet a tolerable judgment can frequently be formed before. In head presentations, on performing ballotment, the head is felt, like a firm round tumor, occupying all the space which the finger can reach, very differently from any other part. The peculiar cramps in the female's lower limbs, and frequent inclination to urinate, mentioned in the signs of labor, are also strong indications of this presentation, being seldom experienced in any other. When the labor has actually commenced, there can be but little uncertainty in these cases, for immediately the mouth of the womb is sufficiently open, the finger can be introduced, and the head felt like a smooth, round, and elastic bony tumor, not likely to be mistaken for anything else, if ordinary care be taken. After the waters have escaped, it can of course be felt still more distinctly. If even an inexperienced person bears in mind the *shape* of the head, and reflects how it must *fill up* the passage, and how it must feel, from being composed of separated thin bony plates, lying on a soft yielding substance like the brain, he can scarcely fail to recognize it. The sensation is very much like that of pressing a piece of firm cardboard on an inflated bladder, which forms a tolerable representative of the foetal head. Sometimes there is a difficulty from a great quantity of water being intruded between the membranes and the head, which somewhat obscures the touch, but this only necessitates greater care. The water however, may be in such quantity as to entirely prevent the touch, in which case nothing can be done till the membranes break; the presentation can then be ascertained with certainty, and it will be quite early enough to render assistance, if it should be an unfavorable one. I have known some inexperienced persons mistake the bag of water itself for the head, and commit great errors in consequence.

The face can seldom be mistaken, because the nose or mouth may be felt; and, by passing the finger up the side of the head, the ears also.

The trunk is in general easy of recognition. Nearly always the right or left shoulder occupies the passage, or is near to it, so that the finger may be readily passed under the arm-pit. The shoulder joints, the ribs, or the shoulder blade bone, all feel very different to the head, and are not likely to be taken for it.

In presentations of the lower extremities there is still less danger of error. If the feet or knees occupy the passage, they can scarcely be mistaken. The breech is certainly something like the head in its form, but feels different, and is divided down the middle by the indentation between the two cheeks, along which the finger can be passed till it enters between the limbs.

In irregular presentations, as of the arms for instance, or of one leg, or an arm and leg, it is only necessary to carefully feel them, so as to ascertain their form and the relation of their parts. Thus the fingers can be distinguished from the toes, and the feet from the hands, particularly if the ankle can be felt. The accoucheur should ascertain the particular presentation *as early as possible*, because he may sometimes be of service in correcting an unfavorable one, if he is certain of it in time, and knows what he is about. He should not, however, use any degree of force to ascertain it, in case he cannot do so without, but wait till the conditions are more favorable. Neither should he, with the same object, rupture the membranes too soon, for

he may thereby cause considerable delay and difficulty, without any good to counter-balance it.

All the above-named presentations may, and usually do, terminate spontaneously, except those of the trunk, and even they do occasionally, though more frequently they require assistance.

Relative Frequency of the different Presentations.—The most favorable presentations and positions are also always the most frequent, while the unfavorable ones are but seldom met with. According to Madame Lachapelle, in *fifteen thousand six hundred and fifty-two labors* there are about *fourteen thousand seven hundred and forty-nine* presentations of the head and face; about *five hundred and eighty-six* of the breech, knees, and feet; and only about *sixty-eight* of the trunk or shoulders.

Positions.—The position is generally of but little consequence, because in all the favorable presentations spontaneous delivery occurs in every position alike, and in the unfavorable presentations the same assistance is required in one position as in another. In some cases an unfavorable position of the head may be changed, however, to a better one; and therefore, so far as the head is concerned, the positions are worth ascertaining.

The mode of determining the position is by feeling for the *sutures* and *fontanelles*, above described; and this cannot be usually done till after the membranes are broken, when the head can be distinctly touched. By referring to Fig. 161, the shape and position of the fontanelles will be seen, and if the head be supposed placed with the top downward, and the back of it to the mother's left side, they may be readily found with the finger.

In the left anterior occipito iliac position—or that where the back of the child's head is against the left side of the mother's pelvis, and nearest the pubes, while its forehead is against the right side, and nearest the sacrum—the sagittal suture, or opening along the top, will of course run across from right to left. This opening may be distinctly felt with the finger, which should be passed along it towards the right side, and it will then reach the *anterior fontanelle*; afterwards it should also be passed to the left side, and then it will reach the *posterior fontanelle*. The difference between these two openings, in shape and size, is shown in previous figures, and even if a person has never seen or felt the head of a new-born child, they can scarcely be taken for each other, after noticing these figures.

If the anterior fontanelle should be felt on the left side instead of the right, and near the pubes, while the posterior fontanelle is to the right, and near the sacrum, the position must be the *right posterior occipito iliac*, or just the reverse of the former.

If the sagittal suture should be found to run across from the pubes to the sacrum, instead of from one side to the other, it will then indicate either an occipito pubic, or occipito sacral position, according as the back of the head is behind or before; and this can be readily ascertained by finding either of the fontanelles.

In short, if the relative position, forms, and directions of these openings in the child's head be clearly understood, the position of the head can nearly always be determined by feeling them, as will be evident by referring to our former explanation of them.

Sometimes however, the bones overlap a good deal, from the head being pressed, and then, instead of an opening along the top, a *seam* will be felt. And sometimes from long-continued pressure, a quantity of blood, and watery fluid, will be effused

under the scalp, so as to prevent the bone being distinctly touched. But these accidents seldom happen, and with ordinary care and perseverance, need not prevent the position being determined, after a little delay.

The position of other presenting parts is easily ascertained, by feeling for some known point—as the *nose*, or the *face*, the depression between the cheeks, or the breech, and so on.

Relative Frequency of the different Positions.—The most favorable positions, like the most favorable presentations, are also the most frequent. According to Baudelocque, in *ten thousand three hundred and twenty-two* cases of head presentation, there were *eight thousand five hundred and twenty-two* cases where the back of the child's head was on the mother's left side, and towards the front (or in the left anterior occipito iliac position); *one thousand seven hundred and fifty-four* where it was on the *right* side towards the front (right anterior occipito iliac); *twenty-five times* to the right side, but towards the sacrum (right posterior occipito iliac); and *nineteen times* on the left, but towards the sacrum (left posterior occipito iliac). Being most frequently with the back of the head *towards the front on the left side*, next towards the front on the right side, and but seldom towards the sacrum, or back, on either side. In all these ten thousand cases we do not find a single instance of the head lying from back to front, in the *occipito pubic*, or *occipito sacral* positions, commonly called transverse; neither do we find a single instance in *fifteen thousand six hundred and fifty-two* cases recorded by Madame Lachapelle, which will show how rare such unfortunate positions must be. What this great frequency of one particular position depends upon we do not know—possibly on that cause, previously alluded to, which determines the most frequent presentation.

In the next chapter, the mechanism of delivery, or the manner in which the child escapes out of the body, as it most frequently occurs, will be fully explained.