CHAPTER I.

VERSION.

VERSION is an operation which changes one presenting fetal part for another. There are two varieties, according as it is the head or the breech which is brought to the pelvic brim: Cephalic version, Podalic or pelvic version. Each one of these methods may be practised by either external or internal manœuvres; but, although cephalic version is usually performed by external manipulation, podalic version, on the other hand, almost exclusively calls for internal manipulations. Latterly, both internal and external manipulations have been conjoined, under the names of *combined* or *mixed* version, or *bi-polar* of Braxton Hicks.

To-day the advantages of pure external version are so generally recognized, especially for cephalic version, that it has become the routine method. By means of it we are able to remedy vicious presentations of the fœtus, such as those of the shoulder, and it thus renders unnecessary resort to operations as dangerous, almost, for the mother as for the child.

Version by External Manipulations.

Struck by the infinitely better prognosis both for the mother and the child offered by vertex presentations, naturally the earlier obstetricians aimed at substituting the vertex for every other presentation. This practice, indeed, is found to have been prevalent amongst the very earliest races, and the Mexicans and the Japanese resorted to more or less crude methods to cause the fœtus to present in normal fashion. Thus, amongst the Mexicans, the woman, from the beginning of the seventh month, was subjected to massage in order to force on the fœtus presentation by the vertex, and if this did not suffice, she was seized by the feet, held head downward, and shaken until the desired end was attained. In Japan, a special family constitute the accoucheurs, and their method of action is the following: "If the vertex does not present, the woman loosens her

clothing, and, lying on her back, the physician massages downward from the thorax towards the epigastric regions. If the fœtus is on the right side, the physician places his knees against the woman's left side, and with his hands pulls the fœtus over. If fæcal masses obstruct on the right side, these are pushed down by the physician's left hand, whilst his right shoves the fœtus where it belongs. No force is ever used in these manœuvres. During labor, if the arm or the elbow presents, this is pushed back into the uterus, and held there by the right hand externally, whilst the left hand seizes the fœtus through the abdominal walls, and it is turned from right to left till the vertex presents." (Kangawa.)

Hippocrates advised succussion; the Arabian physicians and Rhazes advised transferring all presentations into that of the vertex, the latter even going so far as to counsel amputation of the presenting part in order to gain space for the vertex.

Roesslein (1513) and Rueff (1554) counselled cephalic version even in case of breech presentation; but at this date, Ambroise Parè (1550) and his pupil Guillemeau, advise podalic version by internal manipulation, and under the influence of Mauriceau (1668) and of Lamotte (1721) cephalic version nearly disappeared from French practice. In 1690 Siegmundin again advocated cephalic version by internal manipulations. Again neglected for a while, it reappeared in 1750, through the influence of Smellie, who soon gave it up, and then it was advocated by Aitken in 1784, who advised an attempt at cephalic version always before recourse to podalic. It was not, however, until Wigand's time (1817) that cephalic version was carefully described, and its indications laid down.

In Germany, external version was practised from the time of the appearance of Wigand's monograph, by d'Outrepont (1812), Siebold (1821), Busch (1826), Michaelis (1833 to 1838), Kilian (1834), Lumpe (1843), Martin (1849), Naegelé and Grenser (1854), Scanzoni (1855), Crede (1853), C. Braun (1859), Spaeth (1857), Hegar (1869), and above all, by Schroeder (1874 to 1876), Esterle (1878), and Spiegelberg (1878–1880).

In England, external version was not recognized by Ashwell (1828), Blundell (1830), Ramsbotham (1844); and although Rigby (1841) and Churchill (1842) were familiar with Wigand's monograph, they did not appreciate all the advantages to be derived from this operation. It is only since the appearance of the works of Barnes, Duncan, and Playfair, that it has become classic.

In America the same holds true, and it is only of late years that external version has acquired place amongst the obstetrical operations.

In France, in 1845, Hubert de Louvain demonstrated the advantages of external version, but it is only latterly that Tarnier and his pupils, Chantreuil, Pinard, and Budin, have made the method a familiar one to all.

"External version," says Pinard, "ought to be practised in pregnancy in every case where, after the eighth month, the vertex lies in one of the iliac fossæ, or in the upper uterine segment." For our part, we do not agree entirely with our colleague in regard to external version, for we make an exception in case of breech presentations.

Basing his deductions on the figures given by Hegar and Hecker in regard to the mortality in pelvic presentations, Pinard, in accord with Maffei, Hegar, Chantreuil, and Budin, forcibly insists on external version in case of pelvic presentations, and declares that: "1. In breech presentations, cephalic version is possible; 2. It is dangerous neither for mother, nor for child." If these two propositions are perfectly true, they are still open to certain objections, one of which has already been mentioned by Pinard himself: "The breech may recur again after a number of versions." It is true that this may be prevented by the application of a binder, but we have seen that certain women will not tolerate the binder. If, however, we grant this objection, there is another, which we believe to be grave, and it is the following: Pelvic presentations are especially serious in primiparæ, for in them the resistance offered by the cervix and the soft parts is much greater than in multiparæ. In the latter, pelvic presentations are not very grave, and for our part we have always seen such presentations, whether complete or incomplete, terminate happily in them. If there is an instance where external version ought to be practised by preference, in pelvic presentations, it is in primiparæ. Now, amongst the contra-indications to cephalic version, Pinard cites presentations of the breech in the primipara. Whence the dilemma, either version is useful in case of primiparæ, and therefore why in such instance is it contra-indicated? or it is useless and impossible, and why then attempt it? Why, above all, reserve version for multiparæ, where labor is easy, and entails danger neither for the mother nor for the child? If it be true that cephalic version by external manipulation is without risk for either mother or child, it is also, we think, useless in multiparæ, often impracticable in

primiparæ, that is to say, just where it is really useful. Therefore do we reject it in both cases, and here we are in agreement with Pajot and with Depaul.

The first, the great indication for external version, and for us it is absolute, is *presentation of the trunk*. Herein all authorities agree. When, during pregnancy, the position is transverse, we must perform cephalic version, and endeavor by every means in our power to maintain the new position.

The second indication is, for us, pelvic deformity, and herein we accord fully with Tarnier and his pupils, but we hasten to add where pregnancy has reached term. Pelvic presentations, it has been seen, are more favorable before term, (Milne, Goodell, Budin), and therefore podalic version is indicated; but, at term, vertex presentations are more favorable, and, therefore, cephalic version should have the preference.

The third indication is *abnormal insertion of the placenta*, all the more so since abnormal presentations are usually associated.

According to Pinard, external version is contra-indicated: 1. In certain pelvic presentations, in primiparæ especially; 2. In multiple pregnancy; 3. In certain cases of shoulder presentation, where there exists uterine deformity; 4. During labor.

Here, again, we differ from our colleague. In regard to his third contra-indication, we believe it theoretical rather than practical, for it is difficult, if not impossible, to recognize, during pregnancy, the uterine deformity to which he has reference, (median partition), and in the presence of a transverse presentation we believe in always attempting external version.

In multiple pregnancy, it is only after the birth of the first fœtus that external version is possible, and then it is very easy.

The contra-indication as to labor seems to us too absolute. Wigand states as conditions where it is possible: The waters have not entirely escaped, or but a little while; the uterine pains are neither irregular nor spasmodic. Hubert says that external version may succeed during labor, at times even after the waters have entirely escaped. We believe that version by external manipulations should be attempted in transverse presentations, even at the beginning of labor. It is difficult; it will often fail; but the fear lest thereby we cause prolapse of the cord or of a limb, or produce a face presentation, does not appear to us well founded. Even

where it fails, we may still resort either to the bi-polar method or else at the right time to podalic version.

The conditions necessary for success in external version are: 1. The diagnosis of abnormal presentation must be precise; 2. The uterus must not be too irritable; 3. The fœtus must be moveable enough to allow of change of position without injury to the uterus. The membranes must be intact, or at least there must remain in the uterus considerable liquor amnii; 4. Version once performed, the vertex must be maintained in its position. (See Transverse Presentations, Vol. I.)

External Version before Labor.—Operative Method.—The oldest and simplest method, but so useless that it has long been renounced, was to cause the woman to lie on her side, to the right if the head was deviated to that side, and *vice versâ*, a pillow under the abdomen, and to leave her in this position until the vertex had lodged at the superior strait. In transverse presentations this method always fails, and to-day all authorities resort to the following manœuvre, as described in Pinard's work: "Before operating, the woman should be made to assume the dorsal position, the legs extended, and slightly separated. If, during the manipulations, the uterus should contract, we must stop, and await relaxation.

1. "*The head is in one of the iliac fossæ, and the breech is in the opposite flank.*—One hand is to be applied to the vertex, the other to the breech, and by slow, sustained pressure exercised in opposite directions on the fœtal poles, bring them into the median line."

Nivert, on the contrary, counsels that pressure be alone made on the cephalic end, for the reason that pressure applied to both poles in opposite directions simply amounts to nothing. We cannot agree in this, but believe with Pinard that pressure on the breech is much more efficacious than that on the vertex, since it is more readily transmitted to the vertebral column; and further, where the infant is large, or the uterine axis transverse or oblique, exclusive pressure on the head amounts to nothing.

2. "*The head is in the upper segment of the uterus, the breech below.*—We must first mobilize the fœtus, by either pressing down the head laterally, or by lifting up the breech on a finger in the vagina, and pressing down the head in the opposite direction; the two poles being now accessible, slow and sustained pressure must be made so as to make the head ascend, and the breech descend by the shortest route. The pressure on the breech has always seemed more effective than that on the head."

External Version during Labor.—E. Martin manipulates as follows: "The woman lies on her back, the pelvis slightly elevated, the operator sitting by preference with his back to the woman's face. One hand is applied over the inferior portion of the abdomen so as to push towards the superior strait the fœtal pole nearest it, whilst the other hand is applied above, and pushes towards the fundus the higher fœtal pole. These manœuvres are applied only between the pains. During a pain, the ob-

FIG. 1.—EXTERNAL CEPHALIC VERSION. TRANSVERSE PRESENTATION. (*Pinard.*)

ject is simply to retain the ground gained. After an interval the manœuvres are repeated. If the hands tire the nurse may be entrusted with the uterus during a pain. At times it is advantageous to make the woman lie on that side towards which the inferior extremity is deviated, usually the head, and pressure is applied to it either by the hand or by a cushion. Once the head engaged, the woman should retain her position, or else the membranes may be ruptured, and the fœtal part thus fixed."

According to Playfair, "external version should never be resorted to,

except where the abnormal presentation has been recognized before labor, or at least before rupture of the membranes. It is only applicable to transverse presentations, for we must not expect to obtain complete evolution of the fœtus, but only a substitution of the head for the lower extremity." It is thus seen that we are in complete accord with the opinion of the English accoucheur.

Combined External and Internal Version.—Bi-polar Version.—

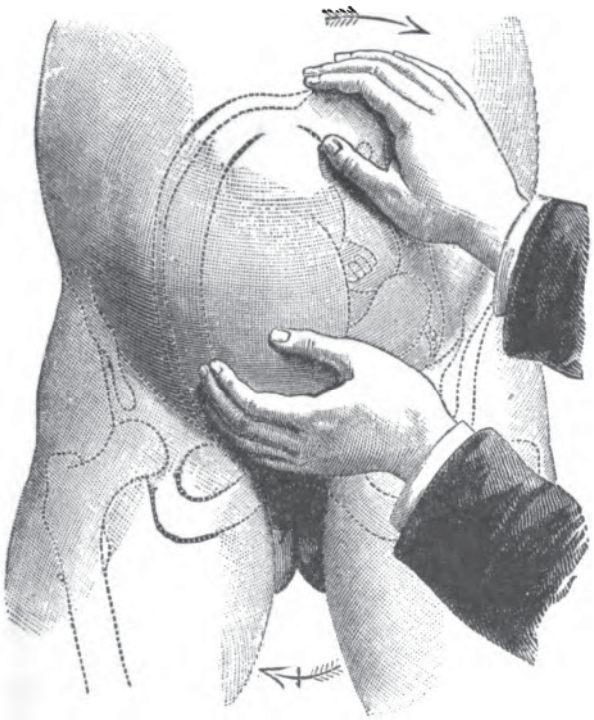


Fig. 2.—Cephalic External Version. Presentation of the Breech. (*Pinard.*)

This consists in acting with one hand externally on one fœtal pole, while the finger in the vagina acts on the other. In the hands of d'Outrepont, Esterle, Rigby, Simpson, Robert Lee, it was a method applicable to cephalic version, and Hohl, according to Naegelé and Grenser, practised it as follows: "The parturient lies horizontally, until the head has engaged. When the uterus is inclined to one side, the woman reclines on the opposed side. The uterus is steadied by an assistant, whose hands are applied flat against the lateral superior sides of the uterus. At

the moment when, by manipulation, the head is brought towards the superior strait, the assistant gently pushes the uterus towards the same side, for example, to the left, when the head is deviated to the left. Then we place the left hand above the horizontal rami of the pubes on the side of the head, while the index and the middle finger of the right hand, in the vagina, rest on the fœtal shoulder. These fingers gently lift the body and push it towards the mother's right, during the intervals of a pain if the membranes are intact, constantly if they have ruptured, while

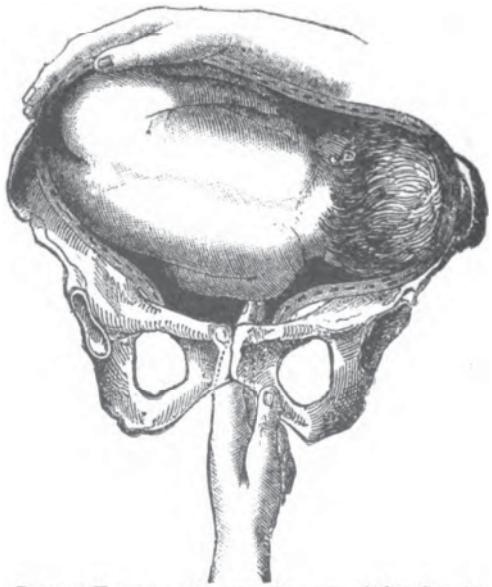


FIG. 3.—BIPOLAR VERSION. CEPHALIC VERSION. (After *Braxton-Hicks.*)

with the left hand the head is pushed towards the superior strait. The head once engaged, we rupture the membranes, but only when the liquor amnii is abundant."

Braxton-Hicks applies these manœuvres to every variety of version, both cephalic and podalic, whatever the presentation, and this not only when the presenting part is above the brim, but also after the waters have escaped, even though the fœtus is deep in the cavity, and the cord or an arm have prolapsed. (Figs. 3 and 4.)

He thus describes his method: "Introduce the left hand into the vagina, place the right hand on the abdomen, in order to recognize the position of the fœtus, and the direction of the head and the feet. If, for

example, the shoulder presents, it should be pushed by one or two fingers in the direction of the feet; at the same time pressure is exercised with the other hand on the pelvic extremity of the child. (Fig. 3.)

"This pressure will bring the head towards the orifice. It is received on the ends of the internal fingers, and it may be placed in any desired position. If the breech do not rise easily towards the fundus, after the head has been applied over the brim, the hand should be withdrawn from the vagina, and applied to the breech to cause it to rise. The head should

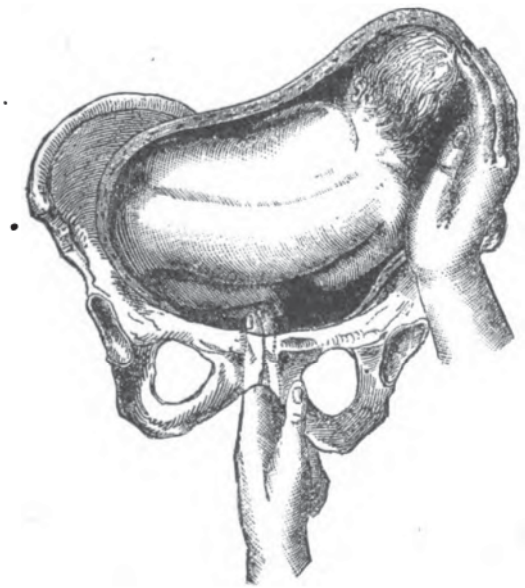


Fig. 4.—Bipolar Version. Podalic Version. (After *Braxton-Hicks.*)

be steadied gently for a while, until the pains have fixed the child in its new position, and until the uterine walls have accommodated themselves to the new form. If the membranes are intact, it is useful to rupture them as soon as the head is over the internal os. The head will then retain its position."

This method, which requires a certain degree of cervical dilatation and consecutive rupture of the membranes, is applicable only to the beginning of labor; for we doubt its success when the waters have escaped, the uterine contractions are energetic, and the uterus has contracted down on the fœtus.

To resume then: Perform cephalic version at the end of pregnancy,

and at the beginning of labor, in every case of transverse presentation; at the end of pregnancy retain the head in its position by means of Pinard's binder, whenever it is borne; if not, await the onset of labor, do cephalic version, and rupture the membranes to fix the head; such is our advice. Abstain from cephalic version in case of presentation of the pelvic extremity, for it is often impossible in primiparæ, and it is useless in multiparæ. Nevertheless, since it is not injurious, the accoucheurs who try it are not to blame.

Version by Internal Manipulations.

This may be either cephalic or podalic. The first, practised almost exclusively by the ancients, has to-day been rejected, and the latter substituted to such a degree that, when the word *version* is used unqualified, it refers to podalic version by internal manipulations.

Internal Cephalic Version.

Up to the times of Ambroise Parè and of his pupil Guillemeau, this form was alone practised, although hardly with success, since in 1122 we find Albucasis saying, with resignation worthy of a Mahommedan, "Version will succeed in case it please God." It was Siegmundin, Busch, d'Outrepont, and others, who first laid down exact rules for its performance. The method recommended was (Busch) to rupture the membranes with the right hand where the head was to the left, and *vice versâ*, and, seizing the head by the neck, to bring it to the superior strait. Two fingers steadied the head, and with the other hand the uterus was massaged to excite it to contract, and the fingers in the vagina were only withdrawn when the head was firmly engaged.

D'Outrepont, and others, advised action on the trunk by means of the hand in the vagina, while the external hand endeavored to depress the head towards the superior strait. Here is seen the germ of Braxton-Hicks' method. Hohl and Wright counselled placing the right hand, where the head was to the left, on the head, the left hand in the vagina, and its fingers in the axilla. These fingers lift the body and press it towards the maternal right side, while the right hand pushes the head towards the superior strait, an assistant, at the same time, pushing the fundus uteri to the left. (Fig. 6.)

Rigby (1844), Simpson (1845), Robert Lee, Braxton-Hicks, thus used

both hands; but, as has been pointed out by Barnes, it is the external hand which does most of the work, and to-day, therefore, cephalic ver-

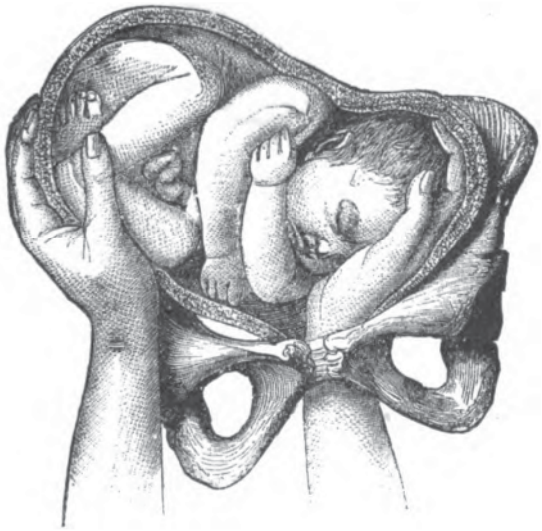


FIG. 5.—CEPHALIC VERSION. (After *Busch.*)

sion is performed by pure external manipulations at the end of pregnancy, and at the beginning of labor.

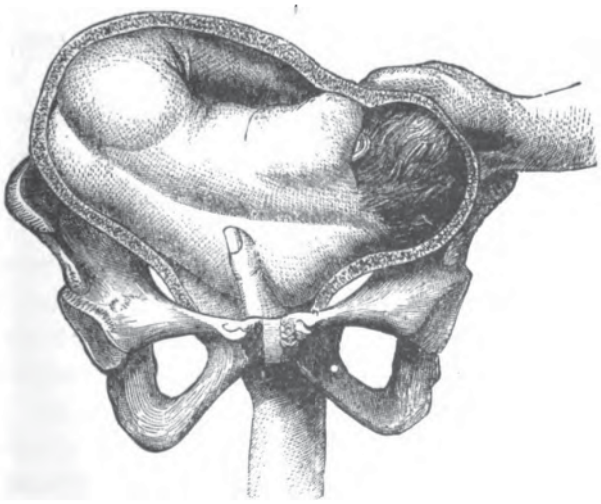


FIG. 6.—CEPHALIC VERSION. After *D'Outrepont.*)

During labor, indeed, internal cephalic version has been justly abandoned. Usually it is impossible, or, if possible, podalic version is more

so, and should be chosen, since then we may end labor at will; the risk to the child will not be greater, and podalic version is always quicker than cephalic.

Podalic Version.

It is in the works of Celsus that we find the first rules applicable to this form of version—applicable, however, only when the fœtus is dead. Although Villanova, (1312), Benivieni, (1502), and Rösslein, (1513), knew this method, it is not till the times of Ambroise Paré, 1560, that we find a description of this method of version and extraction. In 1561, Franco reproduced the text of Paré's work, and in 1609, Guillemeau modified somewhat the operative method. From the time of Mauriceau (1668), Lamotte (1721), Puzos (1753), podalic version replaced cephalic version. In 1685, Portal performed version by one foot, and Puzos and Deleurye made clear the advantages of using a single foot. The latter, also, carefully differentiated version from extraction, and Denman (1788), and Boer (1791), insisted on this point. Finally, Osiander, Levret, Smellie, Stein, carefully studied the indications and operative technique, and Osiander showed that version may succeed, at times even when the head has already engaged, and this too, as he says, *non vi sed arte.*

Podalic version is then an operation which consists in bringing to the superior strait the pelvic extremity of the fœtus, no matter what the previous presentation.

It is indicated whenever normal labor is impossible on account of abnormal presentation of the fœtus, and where cephalic version is impracticable. The indications, then, are:

1. Transverse presentations during labor.

2. Every complication which endangers the life of the mother and of the child, and which calls, consequently, for rapid termination of the labor. Such, for instance, are hemorrhage, eclampsia, rupture of the uterus, certain face presentations, prolapse of the cord, certain monstrosities, pelvic tumors causing dystocia, etc.

3. Pelvic deformity.

a. The indication is absolute in case of transverse presentations which could not be remedied before labor, or which were not recognized, after the seventh month. Up to six months, the fœtus is small enough to allow us to count on spontaneous evolution. Before resorting to podalic

version, the diagnosis must be exact, that is to say, we must know not only that the shoulder presents, but which shoulder, and consequently, the location of the head, and the ventral surface of the fœtus.

b. Here version only aims at rescuing the mother and the infant from threatened danger, and not alone to modify the fœtal presentation. In

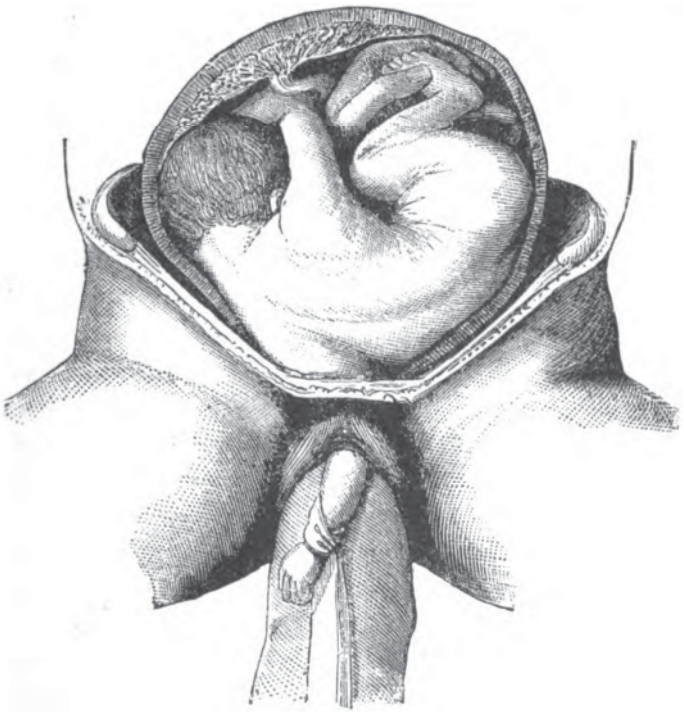


FIG. 7.—PODALIC VERSION.

many instances, then, the forceps will answer, and the accoucheur must decide as to which method of interference will answer the best for the individual case.

c. We have already spoken at length of version in case of contracted pelvis. Although authorities here differ on certain points, they all agree in favor of version in case of oblique contraction, since then the accoucheur may direct the fœtal part towards the greater pelvic space.

Finally, we must not forget that extraction is not necessarily the immediate consequence of version, and that, in many instances, the change of fœtal position having been obtained, it is possible, advantageous at times, to leave the case to Nature.

Conditions necessary for the successful Performance of Version.—Certain ones are absolutely indispensable, and others only favorable.

The indispensable conditions are: 1. The dilatation, or at least complete dilatability of the cervix. 2. Fœtal part not firmly engaged. 3. Pelvis not too contracted. 4. Uterus not too contracted.

A favorable condition, if not absolutely indispensable, is the integrity of the membranes, or at least the presence of enough liquor amnii to allow of fœtal motion, and thus prevent too great contraction of the uterus.

1. *Dilated or Dilatable Os.*—By complete dilatation is understood that condition where the walls merge with those of the vagina, so that the uterine, cervical, and vaginal canals are one; by dilatibility is understood such softness that the cervix may readily be converted into the state of dilatation. We are thus opposed to Schroeder, who claims that it is not absolutely indispensable that dilatation should be such as to allow the introduction of the hand, and that version is most likely to succeed when attempted early. Podalic version, through an undilated os, is very difficult and very dangerous, for it is like *accouchement forcé*, and, therefore, except under stringent necessity, it should never be resorted to unless the cervix is dilated or dilatable. Otherwise we may lacerate the cervix and do injury of serious import to the woman. When version is attempted prematurely, there are two accidents likely to occur: Extension of the arms, and contraction of the cervix around the neck. If this first complication is readily overcome, it is not so with the second. The extended head is imprisoned, the fœtus dies of asphyxia, or if we make violent traction this may result in detaching the head from the body, and leaving it in the uterus.

There is a time of *election* for version, and this when the cervix is dilated or dilatable, and the membranes are intact. If now the membranes are ruptured, and the hand passed at once to the fundus, so as to lose as little of the liquor amnii as possible, the feet may be seized with great ease, and version, except in case of pelvic deformity, may be performed with ease and rapidity.

2. Version consists in evolution of the fœtus. If, now, the fœtus is deeply engaged, or immobilized, the passage of the hand, in the first place, is difficult, if not impossible, and, again, it will be necessary to push up the fœtal part, and this may be impossible, and effort result in

rupture of the uterus. We run the risk then both of killing the mother and the infant.

3. We must never forget that although the flat hand may pass through a contracted pelvis, this hand must come out holding the fœtal foot, and, therefore, no longer flat but closed—that is to say, it must make its exit increased in volume by the fœtal part, as well as by the fact that it is doubled on itself. We must never then attempt version in a pelvis contracted below 2.7 inches.

4. The uterus must not only allow the introduction of the hand, but it must also be yielding enough to permit fœtal evolution, and to allow retractility without danger of rupture. Sometimes the uterus is irritable, and then, if we wait a little, it will be possible to do version with ease. All depends on the necessity of rapid delivery, which, if it does not exist, may render embryotomy out of the question.

There are, above all, two causes of exaggerated uterine contractions: Total escape, and for long, of the liquor amnii; premature administration of ergot.

1. The most favorable, if not indispensable condition for version, is the *integrity of the membranes*. This condition, however, is rarely fulfilled, for the presentation being above the brim, premature rupture often occurs, and the waters flow off readily, the uterus contracting on the fœtus the less the amount of liquor amnii present. Enough water, then, must at least remain in the uterus to prevent such contraction, and to allow fœtal evolution. Unfortunately, it must be said, premature escape of the waters is often the result of error on the part of the physician, oftener still of the midwife. The membranes are ruptured before the assurance has been gained, by palpation, of the presentation, in the hope that the fœtal part will engage. The rule should be to wait for complete dilatation before rupturing the membranes. Once the time of election at hand, rupture, and at once insert the hand into the uterus, thus effectively tamponing the cervix and preventing entire escape of the waters. In case the head presents, if in the interests of the mother and the infant it is necessary to end labor, push this up, search for a foot, turn and deliver, or else have recourse to the forceps.

2. We have already stated that we are absolutely opposed to the administration of ergot as long as there is anything in the uterus. Particularly does this apply to cases of abnormal presentation. Unfortunately

the error is often committed of administering ergot in these cases, and it is then that we see supervene those tetanic contractions, which are but too often followed by spontaneous rupture of the uterus, a rupture all the more certain if we attempt version. Here version is contra-indicated, and embryotomy must be resorted to, and this is also indicated by the fact that the fœtus is usually dead.

Preliminary Precautions.—Before practising version, there are a number of precautions to be taken, certain of which are indispensable to success. We must above all be sure of our diagnosis. If the head presents, make out whether it be vertex or face, to what point of the pelvis the occiput or the chin points—in other words, not only diagnosticate the presentation, but the position, in order to know where the feet are. If the body presents, recognize by which shoulder; sometimes such exact diagnosis is not possible, until the hand is in the uterus. Further, any instruments which might be required, such as the filet, laryngeal tube, scissors, etc., should be at hand. The bed should have considerable elevation, and be resisting, for, since it is necessary for the hand to pass to the fundus, the operator will have to depress the arm greatly. It is often necessary to place a board under the mattress in order that the woman's nates may not sink too much. Usually, the woman is placed in the dorsal position, the nates at the very edge of the bed, the feet resting on a couple of chairs, and the limbs separated. An assistant should hold each leg, flexing the thigh on the trunk. If necessary a pillow or cushion may be placed under the nates, to elevate them.

In certain instances, where the feet are in front, or difficult to reach, the woman may be placed, for the time being, in the lateral position. The knee-chest position, advocated by certain gentlemen, appears to us objectionable, because it is our habit to anæsthetize during version.

If version is practised at the time of election, and in a woman with large pelvis, chloroform may be dispensed with. Otherwise it is absolutely indicated. The anæsthesia should be complete, surgical, administered by a competent assistant, and should continue during the entire period of the operation. Thus is obtained absolute passivity on the part of the woman, and the operator may act more quickly, aside from the fact that the woman is spared pain.

The bladder and rectum should be emptied, in particular the former by the catheter.

As for the choice of hand to operate with, authorities are not in accord. The general rule is to take that hand which, placed between pronation and supination, corresponds by its palmar surface to the ventral surface of the fœtus. In vertex presentations, for instance, in the left occipital the left hand, in the right occipital the right hand—that is to say, left hand if the feet are to the right, and *vice versâ*.

This is the custom in Germany. In England, where version is performed with the woman lying on the left side, the left hand is always used. For our part, we consider the choice of hand a matter of secondary importance. For if version is easy, one hand will answer as well as the other, and if it is difficult, there is one circumstance which forces us to deviate from theoretical rules. When the liquor amnii has escaped for some time, the inserted hand awakens contraction of the uterus, and the hand is squeezed so that it is deprived of sensation, and we must, of necessity, insert the other hand instead. I have often been obliged to make this substitution a number of times. The best we can do to save the hand is to straighten it out during the contraction, and wait for relaxation before continuing the operation.

It goes without saying that the coat should be removed and the shirt sleeves rolled up. The nails should be cut short, on a level with the pulp of the fingers, and the arm should be well greased, never, however, greasing the hand which is to seize the foot.

Having made the above preparations, we proceed to the *operative method*.

This, according to most authorities, is composed of three stages:

1. Introduction of the hand and search for the foot.

2. Evolution of the fœtus.

3. Extraction of the fœtus. This latter stage does not in reality belong to version, because, once the fœtus turned, version is completed, and we may often leave the rest to Nature. Thus, most German writers describe version under breech presentations. But since immediate extraction after version is the rule, we will follow the example of French writers, and describe extraction in this place.

1. *Introduction of the Hand and search for the Feet.*—The hand should ever be introduced during the interval in the pains. The fingers should be brought together in the shape of a cone, the thumb against them, and penetrate slowly, rotate as it were, into the vagina, the dorsal surface be-

ing turned towards the sacrum when the bottom of the vagina has been reached. At the same time, it is absolutely requisite to control the uterus with the other hand, or by the hands of an assistant, in order that as the fingers enter the uterus the vaginal attachments may not be dragged upon or torn, and again in order that the uterus may be depressed as much as possible nearer the internal hand. Another important point is that the hand be made to traverse the vagina in the axis of its curvature, and in order to do this, as the hand penetrates it is necessary to depress the elbow. The hand once at the cervix, which we suppose to be widely dilated, the membranes are either ruptured or intact.

If ruptured, we must immediately enter the uterus as deeply as possible, even to the fundus, if necessary. The feet, indeed, are usually higher up than is supposed, and many inexperienced operators fail in version because they do not dare pass the hand deep enough. When the hand has reached the fundus, only the thickness of the walls separates it from the external hand. We must, hence, manipulate carefully, and with extreme gentleness.

If the membranes are intact, they must be ruptured. Here opinions vary. Peu, Smellie, Deleurye, Boer, and latterly, Hüter and Naegelé and Grenser, advise introducing the hand between the uterine walls and the membranes, until the feet are reached, and only then to rupture. Hüter has even been able to perform version without rupturing the membranes. For our part we are opposed to this, and we believe the membranes should always be ruptured over the cervix, always, however, at once introducing the hand, and thus tamponing with the wrist, to prevent escape of the liquor amnii. Our reasons for this opinion are: 1. While the hand is passing between the uterine walls and the membranes, these often rupture over the cervix, and version is rendered difficult from the fact that the ruptured membranes are applied closely against the fœtus. 2. If we seize the foot through the membranes, we may pull on the membranes as well as on the foot, and thus cause partial detachment of the placenta. 3. In passing between the uterus and the membranes we may detach the placenta, in case of lateral insertion. 4. Searching for the feet through the membranes necessitates more exact knowledge of their position than we are often able to obtain. 5. As for the possibility of turning without rupturing the membranes, this necessitates very tough membranes, and a very acquiescent uterus; and further, as Schroeder points out, the foot slips in the membranes and is difficult to seize.

Wherefore, again, we recommend rupture of the membranes at the level of the cervix. Three methods of searching for the feet are in vogue.

The first, derived from Madame Lachapelle, consists in going directly to them, seizing them, and bringing them down. This constitutes *hasty* version, and requires very exact diagnosis, and while excellent in such an event, in case of error it exposes us to trouble.

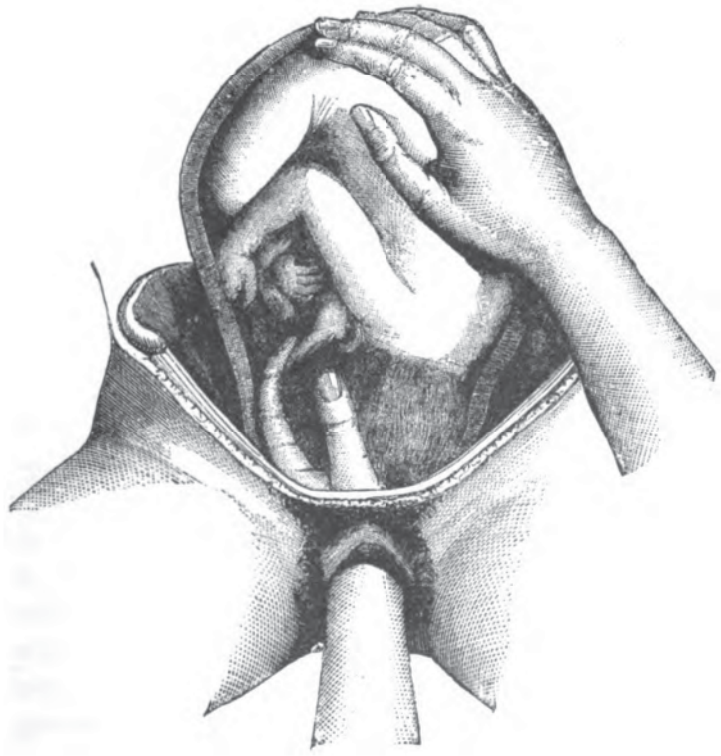


FIG. 8.—PODALIC VERSION. (1st stage.) Introduction of hand to seize the feet.

The second, advocated by Dubois, consists in passing behind the fœtus, lifting it up, following the posterior wall of the uterus up to the fundus. The hand is then turned so that its dorsal surface lies against the anterior wall of the uterus, and the feet are at once found by the concavity of the hand. This is an excellent method, true enough, when the ventral surface of the fœtus is posterior, and the feet there as well. But if the feet are in front, they cannot thus be found.

The third is the classic method. The road is longer, but more certain.

The hand in the cavity seeks the lateral or posterior surface of the fœtus. Following this surface to the nates, and thence along the thighs, and thence along the leg, it surely finds the feet. Bailly advises following the anterior surface of the fœtus, but in order that this method may succeed, there must exist considerable liquor amnii, the fœtus be fairly moveable, the uterus not irritable, and often these conditions are not present. This proposition of Bailly's then is impracticable.

Each one of these methods possesses advantages, but requires special conditions. The best plan is to follow the advice of Lachapelle, having made as precise a diagnosis as possible beforehand. If necessary, we can grope our way to the feet, until we seize a foot or a knee, or even hook the finger, as we will see, in the groin.

Seizure of the Feet.—Must we seize both feet, or one, or, in the latter event, which?

Whenever it is possible to grasp both, this is advantageous, but this only happens in easy version. Barnes prefers the knee to the foot, and insists upon this. Portal first proved that we might turn by one foot. Puzos insisted on but one foot, and this is the practice of almost every accoucheur in France, in England, in Germany. Version thus performed is, they say, easier, quicker, less painful for the mother, less dangerous for the child. "In case of incomplete presentation of the feet," says Schröder, "we are better able to leave the termination of labor to Nature, than where both the feet present. The first part of delivery is, true enough, a little slower and more difficult, but the after-coming head passes the more readily, because of the dilatation of the soft parts by the breech and one thigh. In the interest of the child the inferior portion of the body need not be delivered rapidly, but the superior portion ought to pass quickly."

Which foot ought we to grasp? Authorities differ. The greater number are in favor of the nearest, or lowest foot. (Kilian, Lumpe, Scanzoni, Martin, Lange, Depaul, Bailly, etc.) It is not only easier to grasp, but it further appears anterior at the moment of extraction, that is to say behind the symphysis. This is our practice, and that of Tarnier. Others, on the contrary, advise grasping the superior foot. (Roederer, Joerg, Hohl, Simpson, Kristeller.) Barnes says that thus evolution is more complete, while Scharlau and Haselberg point out that by pulling on the superior foot it may lock with the inferior, and thus render version impracticable.

For our part, whether one or another foot is seized matters little in general. Only when the back is posterior may it be advantageous to grasp the superior foot. As Pajot says, with truth: The best foot is that which is grasped the best.

To distinguish the superior from the inferior foot, we must remember the position of the fœtus, and follow the border of the foot. In case of the superior foot, the internal border faces below, and in case of the inferior foot, it faces above.

If we cannot reach the foot, we must grasp the knee. This is particularly practised and recommended by Simpson, Barnes and Simon Thomas

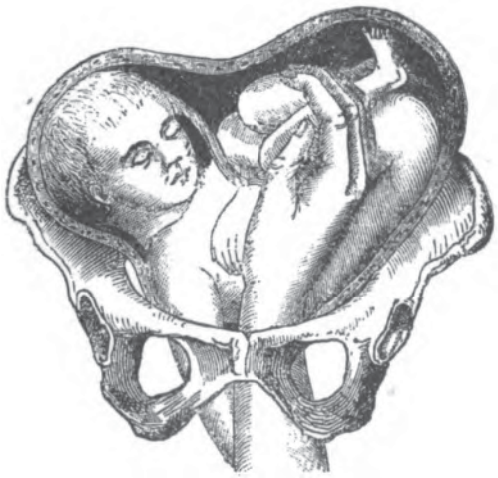


Fig. 9.—Grasp of the Upper (Superior) Foot.

de Leyde. According to the latter, version by the knee offers the following advantages: "1. Whenever the uterus is not too much contracted, whatever the presentation, we reach the knee more readily than the foot. 2. Often we know more certainly, beforehand, the position of the knee. 3. In podalic version the force which changes the presentation acts with greater advantage on the knee, and further we may use more force on it, without endangering the fœtus, in case of difficult version." Barnes adds that the knee is nearer than the foot, and while the latter must be seized by the full hand, the finger bent on itself is enough to pull down the former.

When the inferior extremities are too far from the superior strait, Deutsch advises the following procedure: 1. Make the fœtus undergo a

movement of rotation around its longitudinal axis. 2. Disengage the feet. "As for the choice of hand, this is according to rule. If we are dealing with a shoulder presentation, for example, the dorsal surface of the fœtus being posterior, the palmar surface of the hand is applied to the thorax or the shoulder of the fœtus, and by pressure from in front back, and from below above, the fœtus is turned on its longitudinal axis

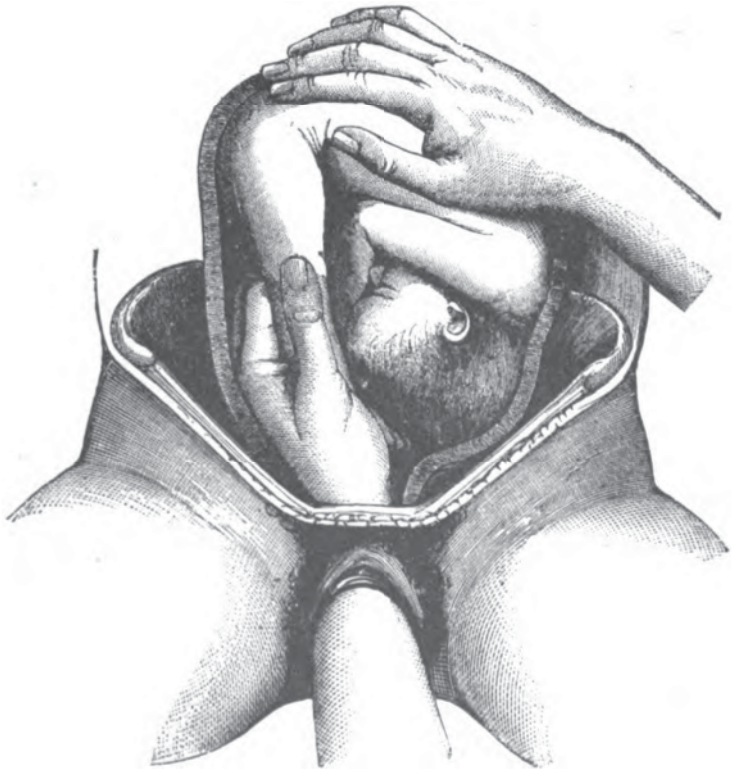


FIG. 10.—PODALIC VERSION. (Second stage.) Evolution of the fœtus.

so that its anterior surface looks downward, and the thorax is elevated. Often many attempts are necessary for the success of this manœuvre. The fœtus is held in this position by the thumb, and the four other fingers are turned downwards, and passed along the back to the nates, the legs are pushed towards the sacro-iliac synchondrosis, and the feet fall of themselves into the hand of the operator." (Naegelé and Grenser.) According to Deutsch, by this method the uterus is less irritated, version is easier, and the danger of fracturing the limbs is slight. The method

does not seem to us practicable, except in the presence of much liquor amnii, a small fœtus, and a non-irritable uterus, and here the usual method will succeed as well.

Finally Gueniot advises, in difficult cases, a method already used by Cazeaux, and which he calls the ano-pelvic.

"1. The weight of the body is to be used to penetrate to the fundus. 2. To take as the fulcrum of the tractions on the fœtus, the pubic arch, or the sacro-coccygeal joint, by means of the curved finger in the rectum. 3. Thence to proceed as in ordinary version." The advantages of this method are: 1. The fœtal pelvis is usually easier to find than the feet. 2. The fulcrum chosen is most solid, and does not yield. 3. Traction being direct, no force is wasted. 4. Whatever the direction of the traction, the evolution of the fœtus may be affected. 5. When podalic version has failed, the ano-pelvic method may still be resorted to with success.

2. *Evolution of the Fœtus.*—This consists in making the fœtus turn on itself, so as to convert the existing presentation into the pelvic. In order that the fœtus may turn, it must not be fixed in the uterus. We must hence act between the uterine contractions.

Wigand has described two methods of action: "The foot seized, traction is made during the pains, taking the precaution to bend the child along its anterior surface, flexion thus being easier and more complete. Formerly this was called the *great turn*. Usually, however, we make traction by flexing the fœtus, first anteriorly, and then laterally, without fear of compression of the spine. This has been called the *little turn.*"

These divisions are rather theoretical than practical, for if evolution be easy, it is accomplished as well by the great as by the little turn, and if it be difficult, that method which is the most rapid is the best, and the accoucheur must act according to circumstances.

Having firmly grasped the foot, traction is made, and we feel the fœtus move. In a general way these tractions should be made downward and forward, in order to bend the fœtus anteriorly. At the same time the other hand, on the abdomen over the head, endeavors to push this up towards the fundus. The tractions should ever be slow and continuous. If the version be easy evolution is rapid, but it may happen that either the head or the shoulder do not move, and evolution does not occur. We then, according to Naegelé and Grenser, try to push up this shoulder or

head towards the side of the pelvis with the thumb or the palm of the operating hand, at the same time that the feet are pulled down. If this does not succeed, we may resort to what has been called double manipulation. (Fig. 11.)

This consists in applying a loop over the foot, and of pulling on it,

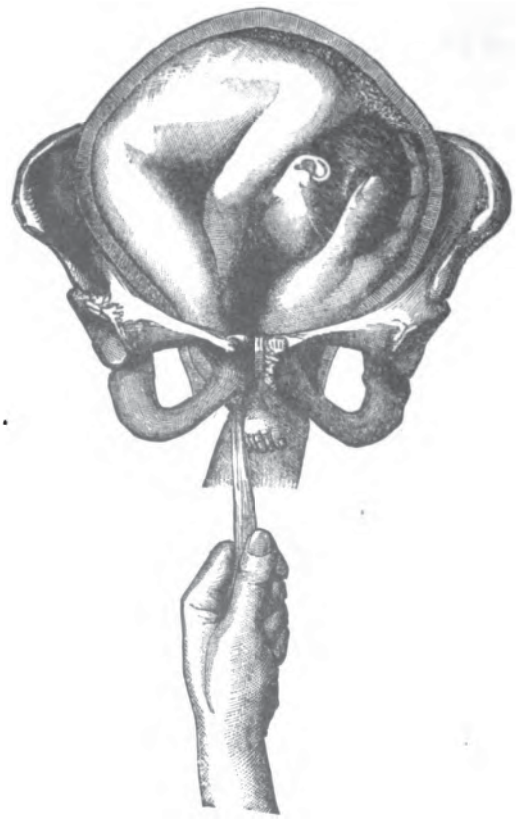


FIG. 11.—THE DOUBLE MANIPULATION.

while the hand in the uterus tries to push the presenting part upward. The uterus must be well steadied by an assistant.

This procedure was known to the Japanese. Numerous instruments have been devised for pushing up the fœtal part, such as those of Maygrier, Burton, Aitken, Otto, etc. All these instruments we believe are inferior to the hand, and if the hand fail, we do not think that any instrument will succeed.

Madame Lachapelle has noted in cephalic presentation a cause of diffi-

culty when traction is made on but one foot. It depends on the fact that the nates may prevent the ascent of the head. If this cannot be pushed up, traction should be made on both feet. In certain instances version is not possible, and then our recourse must be to embryotomy.

We have said that traction should be made downward and forward; but this anterior movement must not be exaggerated, else it may happen that, when evolution is complete, the foot which was not grasped lies across the symphysis, and thus prevents further progress. Then it will be necessary to make traction directly backward, or else to rotate the dorsum of the fœtus backward, or at least laterally, in order that the thigh caught on the symphysis may disengage itself. It is always, be it understood, the anterior hip which thus gives rise to trouble.

The breech once at the superior strait, and at the level of the cervix, version may be considered at an end, and often the case may be left to Nature. We are dealing simply with a breech presentation. But if the pains are slight, if there exist disproportion between the fœtus and the genital canal, if version has been indicated by complications threatening the life of mother and child, then extraction should follow at once on version.

3. *Extraction of the Fœtus.*—The extraction, according to Naegelé and Grenser, may be divided into three stages: 1. The body of the fœtus as far as the shoulders. 2. Extraction of the arms. 3. Extraction of the head. Only, however, in difficult cases, are these stages marked; in case of favorable conditions and of strong contractions, extraction is so easy that the three stages are merged in one.

While efforts at version are to be made in the interval of, extraction is made during, the pains, and it succeeds the better the stronger and more regular the pains. If the two feet have been grasped and brought to the vulva, they are wrapped in a towel, and they are seized with the thumbs above the heels, and the remaining fingers on the ventral surface of the leg. (Fig. 12.) The same rule holds where but one foot has been brought down, the hands being moved upwards as the legs and the nates descend, keeping as near as possible to the joints. The hands thus are applied successively to the feet, the legs, the knees, the nates, as close as possible to the maternal parts. (Fig. 13.)

If traction is made on a single foot, as soon as the breech is extracted the second foot appears of its own accord. Only when the second leg

has extended on the abdomen of the fœtus, need we artificially disengage it. The finger must then be inserted in the groin, in order to pull down the thigh, and then must seek the second foot and endeavor to extract it, but direct traction must never be made, else fracture will result. The best practice, in such cases, is to continue extraction irrespective of the second foot, when, sooner or later, this will spontaneously appear. If,

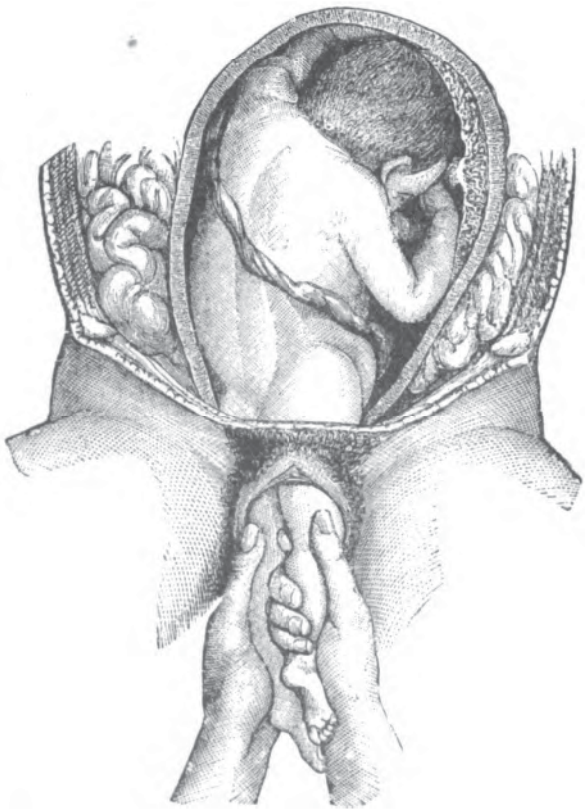


FIG. 12.—POSITION OF HANDS IN EXTRACTION. DELIVERY OF THE INFERIOR EXTREMITIES.

when the nates appear, the fœtus is found astride of the cord, we must try to loosen this by passing it over the natis belonging to the undelivered foot. If the cord cannot be loosened, then it may be ligated in two places and cut between. Of course, in such event, very rapid extraction is indicated.

The breech delivered, the thumbs are applied over the sacrum, the

other fingers over the anterior of the pelvis, (Fig. 13,) and traction is made downwards and slightly backwards, until the thorax appears. If the cord is tense at the navel, it is pulled gently downward, in order to avoid traction on it. If it cannot be disengaged, it must be cut and the fœtal end compressed by an assistant till extraction is completed. Usually, as the body descends the fœtus rotates, so that the dorsum looks for-

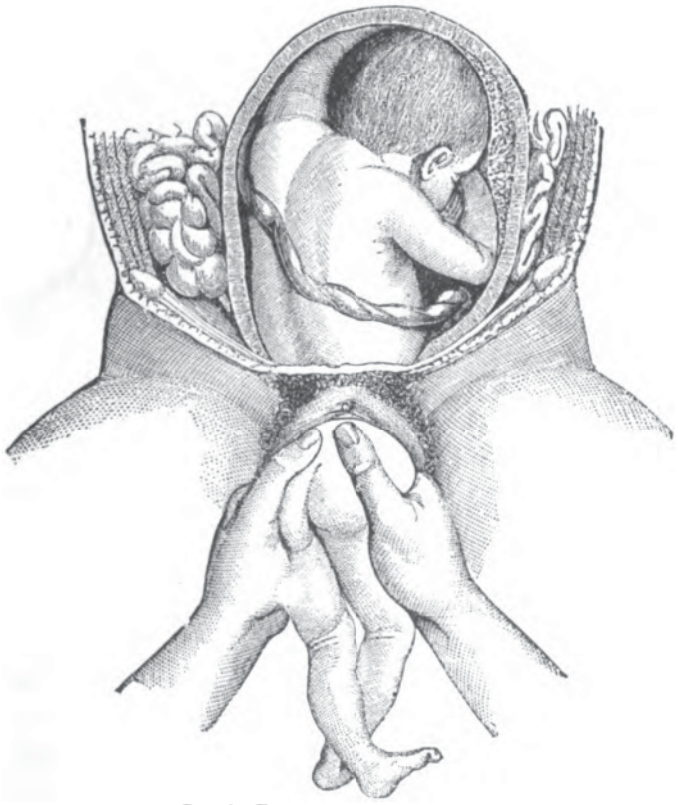


Fig. 13.—Extraction of the Breech.

ward. If this rotation does not occur spontaneously, it must be made artificially. In order to effect this, while downward traction is being made, the fœtus is turned in the desired direction, and this is ordinarily an easy matter. But if the body resists, rather than use force we had best desist.

Where version is easy and contractions good, the arms remain flexed on the chest; but if the uterus retracts more, the arms extend along the

head, and must be disengaged. The posterior arm should be first extracted, and then the anterior, and there remains only the head.

The head may be flexed or extended, the occiput anterior or posterior. If the uterine contractions are not sufficient, we must extract it rapidly, lest the infant endeavor to breathe, and asphyxiate. Since the extraction of the arms and head offers difficulties, we will describe this later on.

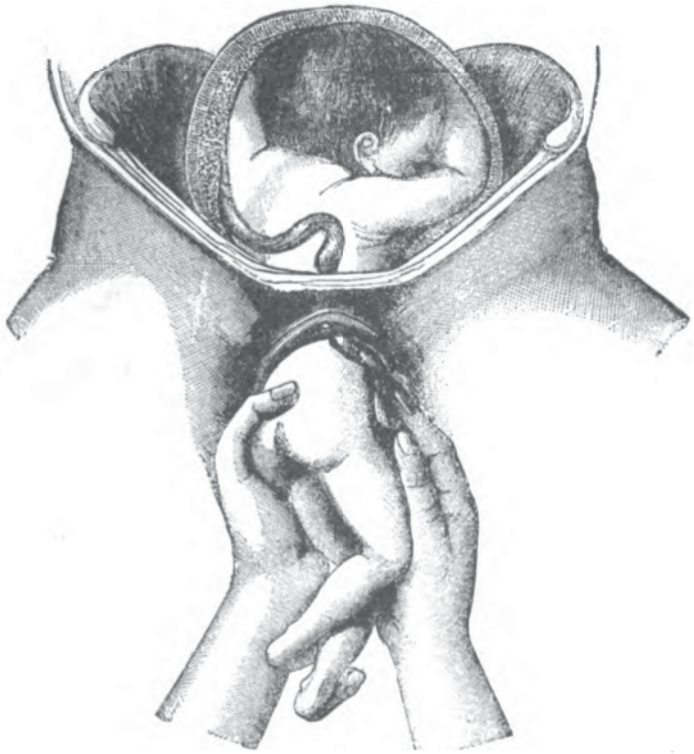


FIG. 14.—LOOSENING OF THE CORD.

The child born, the cord is to be cut as usual, and the same care is given to infant and mother as is customary after normal labor.

Version, as we have described it, is simple version. It is not always so easy, and, as we will see, the operation may become one of the most delicate and difficult the accoucheur is called upon to perform. We will pass the difficulties successively in review.

Obstacles and Difficulties to Version.

I. *Introduction of the Hand.*

The causes of difficulty may lie in the vulva or vagina, (edema, narrowness, rigidity), or be due to obstacles in the canal, (prolapse of the arm or the cord), in the cervix (resistance, rigidity, placenta prævia), in the uterus itself (retraction, tumors, etc.)

a. Narrowness, rigidity, of the vulva or vagina, are rarely so pronounced as to constitute genuine obstacles. Edema and traumatic swelling of the vulva and the external parts are the most frequent obstacles.

Edema of the vulva may depend on albuminuria, and in certain cases it is necessary to puncture the labia in order to affect introduction of the hand. In such cases great care is necessary in order not to bruise the parts overmuch, and thus lead to gangrene.

b. Prolapse of the cord of itself is not an obstacle to version, but the life of the child is compromised, and, therefore, active intervention is called for, and extraction should at once follow version. If the fœtus is dead, the only necessary precaution is not to pull on the cord and thus separate the placenta. If the cord be in the way it may be cut, the placental end being alone ligated, since the fœtus is dead. But we must never forget that absence of pulsation in the cord is not a sure sign of fœtal death, and that for absolute certainty we must listen for the fœtal heart. If, on the other hand, the fœtus is alive, we must particularly avoid compression of the cord. The best plan is to replace it in the uterus above the fœtal part, and if it will not stay there, to terminate version as rapidly as possible.

c. In shoulder presentations, when labor is prolonged, and the liquor amnii has in great part escaped, the shoulder is pushed more and more into the superior strait, and the arm belonging to the shoulder extends, and prolapses into the vagina, often appearing at the vulva. At times the arm is brought down by the inexperienced operator, being mistaken for the leg. The arm thus prolapsed swells, becomes livid, and at times looks gangrenous.

The older writers often placed a piece of ice in the hand to cause it to retire. Mauriceau and others advocated efforts at replacement. Portal (1665) and Deventer (1701) first proved that such efforts were often un-

necessary. Smellie, Levret, Puzos, Lamotte, Van Hoorn, proved that such efforts were not only useless, but often dangerous.

To-day, this prolapse of the arm is considered an advantage, in the first place because we are enabled to make a correct diagnosis, and in the second place, because we may fix this arm and prevent it from extending along the head. We have already seen how, by looking at the hand, or by following the arm up to the axilla, we may at once differentiate the presenting shoulder, and thus know exactly where to hunt for the feet.

We must not judge the infant dead by the condition of the arm, and, as has happened, amputate it; such amputation is never necessary, how-

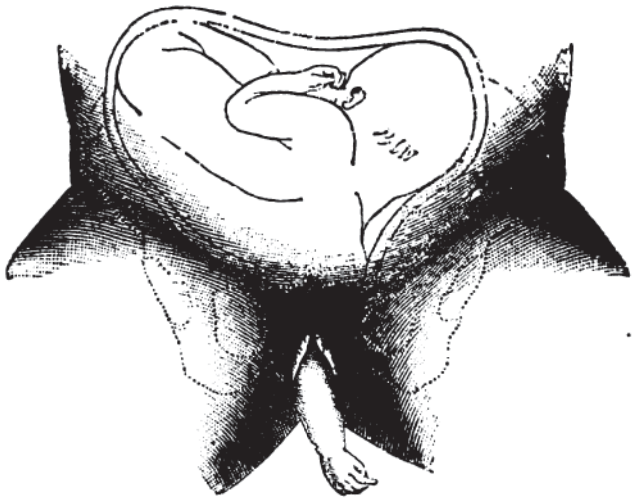


FIG. 15.—SHOULDER PRESENTATION, WITH PROLAPSE OF ARM.

ever swollen it be. Our efforts must be limited to passing a sling over the arm, and thus preventing its extension along the head during extraction.

There are instances, however, where the accoucheur's hand cannot be inserted, because during previous attempts at version the other arm or foot has been brought down. Then, in case of vertex presentation, destruction of the fœtus is necessary. But first we must always assure ourselves of the death of the fœtus. If the foot, as well as the arm and the head, is in the vagina, we have seen that we may have recourse to the double manœuvre, and if this fail, to perforation or cephalotripsy.

d. Obstacles in the cervix may be due to incomplete dilatation, to rigid-

ity, to spasmodic retraction, to placenta prævia, or to tumors of one or another kind opposing dilatation.

1. *Incomplete Dilatation and Retraction of the Cervix.*—In certain cases, the life of the mother or child depends on labor being terminated before complete dilatation; otherwise we must wait for complete dilatation. Baths, hot injections, chloral, chloroform, belladonna ointment, will usually, at the end of a few hours, overcome rigidity.

[In instances where these measures fail, the faradic current, weak, and never passed through the two poles of the fœtus, should always be tried.

A number of instances are on record where it overcame rigidity, and from our experience in cases of uterine inertia, we should be inclined to rank it in value after chloral, which drug is of the greatest possible utility.—Ed.]

If the mother's life or that of the infant is in danger, we must proceed to dilate the cervix. In such cases, chloroform pushed to its fullest extent has been advised. We have but little confidence in it, because the uterine muscle resists above all others the action of chloroform; its contractions have often persisted after the heart has ceased to beat. The action of chloroform is too dangerous and variable for us to be willing to compromise the life of the mother when we have at our disposal other less dangerous means.

Dilatation of the cervix may be effected in a number of ways. Gradually by the hand, or by Barnes' dilators, and then with the greatest care. We reject absolutely the metallic dilators. If gradual dilatation of the cervix be not possible, we much prefer incision. This incision, it is understood, can only be practised when the resistance is at the external os. At the internal os, the hand and Barnes' dilators should alone be used. When these fail, our only resource is in the *accouchement forcé*, however dangerous it be. Venesection, pushed to syncope, often fails.

2. *Placenta Prævia.*—The cervix, on the other hand, may at least be dilatable, and the hand is opposed by the placenta, either partially, or entirely previa. We have seen, when studying this subject, that then the placenta must be partially separated, and the hand introduced above it.

3. *Tumors of the Cervix.*—In such instances, as we have seen, we must await sufficient dilatation of the cervix, especially in the case of fibrous tumors; in case of cancer we must incise the cervix, and if this fail, resort to perforation, or to embryotomy.

4. *Obstacles in the Body of the Uterus.*—Here it is not usually so easy to overcome the difficulties. Often, indeed, either because of premature escape of the waters, or prolonged labor, or premature administration of ergot, or repeated and inexpert attempts at version, the entire body of the uterus is contracted, in a state of tetanus as it were, and the body of the fœtus is held so tightly that it is impossible to pass the hand. We must not then attempt version. To do so would inevitably cause rupture of the uterus. The fœtus must be mutilated, for thus alone can we save the mother.

II. *The Search for the Feet.*

There are a number of conditions which may interfere, and of these we mention mobility of the fœtus or of the uterus. This may be remedied, in part, by allowing a little of the liquor amnii to escape, and in part by fixing the uterus. There are two other more frequent causes, however, and these are the displacement of the feet at previous attempts at version, and the difficulty of grasping them. When the feet have been displaced, we must hunt for them by following along the back of the fœtus to the nates, thence to the thighs, and to the knees, and these, as we have seen, are firm enough to permit of version.

A further difficulty consists in *anterior position of the feet.* They are then situated above the pubes, in the hypogastric region, and, with the woman on her back, the hand cannot reach them, but is stopped by the inferior border of the symphysis. Then it is that the lateral position, and particularly the knee-elbow, are absolutely indispensable. The woman in such position, the feet become posterior, the introduction of the hand is easy, and version as well, whereas before this seemed impossible.

A more serious difficulty is, at times, inability to firmly grasp the feet. In many cases, the foot may be brought down to the upper part of the vagina, but no further, the fingers slipping, and, in order to obtain firm hold, we must pass a sling over the foot, above the ankle, in order to make sufficient traction. The application of the sling is not as easy as one might think. When the foot is outside the vulva nothing simpler; but when the foot is in the vagina, particularly high up, the operation is a very delicate one. A running loop is made, and this is passed around the left fist. Introducing this hand into the vagina, the foot is seized by the fingers as high up as possible, and pulled down. With the fin-

gers of the right hand, the loop is pushed over the left hand, and its fingers on to the foot. Once on the foot it is pushed beyond the heel. When the two ends of the loop are pulled upon, the fœtal limb is held firmly. Unfortunately, this method, very simple in theory, is very difficult in practice. In the first place, the loop, wet by the discharges, does

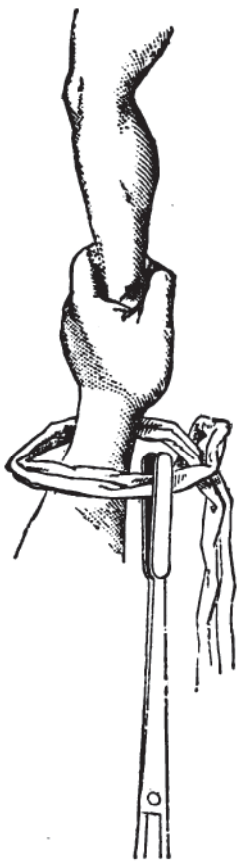


Fig. 16.

Fig. 17.

Fig. 18.

Figs. 16 and 17.—Application of Loop, by means of Dressing Forceps.
Fig. 18.—Van Huevel's Instrument.

not slide easily over the fist and the fingers; then again, the foot may escape from the fingers, or it is difficult to push the loop over the heel, for we have introduced if not two hands, at least one and a portion of the other into the vagina.

Since the time of J. Siegmundin, many instruments have been devised

for carrying up the loop, analogous to those for the cord. For instance, those of Walbaum, Stein, Van Huevel, (Fig. 18), Wasseige (Fig. 19),

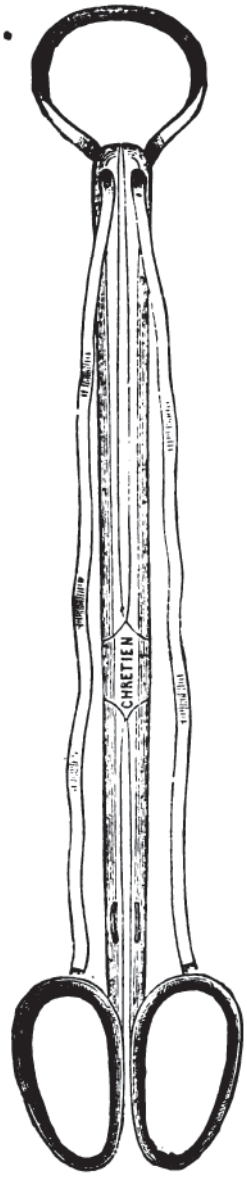
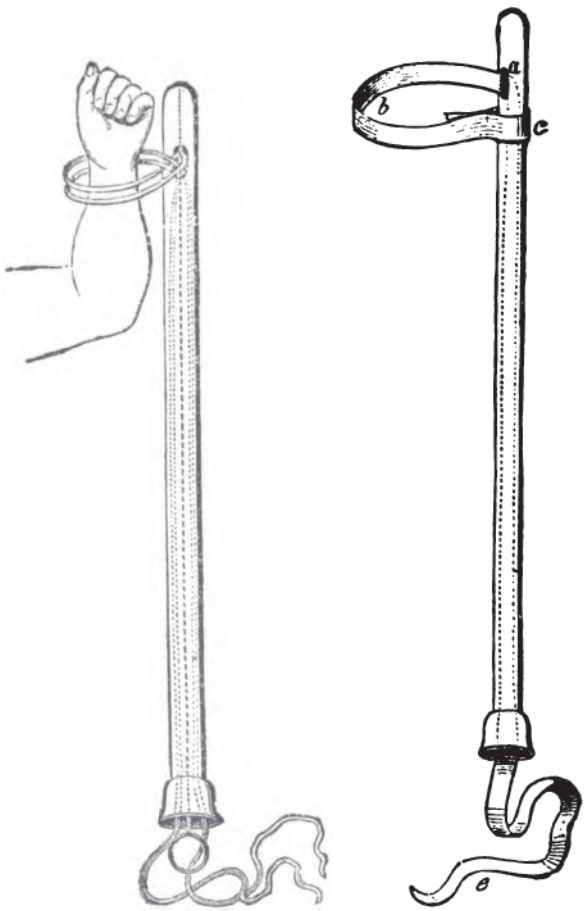


FIG. 19.—WASSEIGE'S INSTRUMENT.



FIGS. 20 and 21.—LAMBERT'S INSTRUMENTS.

Lambert (Figs. 20, 21, 22), Trefurt (Fig. 23), Hyernaux (Fig. 24), Morales (Fig. 25, 26), and all have about the same value.

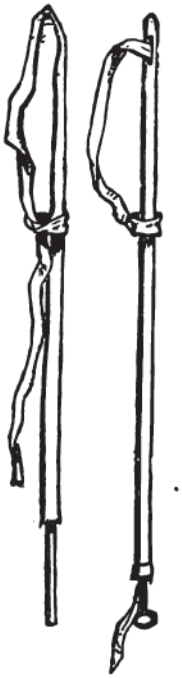


FIG. 22.—LAMBERT'S INSTRUMENTS.

FIG. 23.—TREFURT'S INSTRUMENTS.

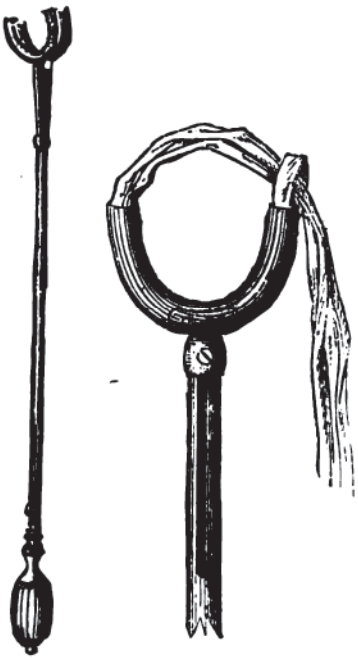
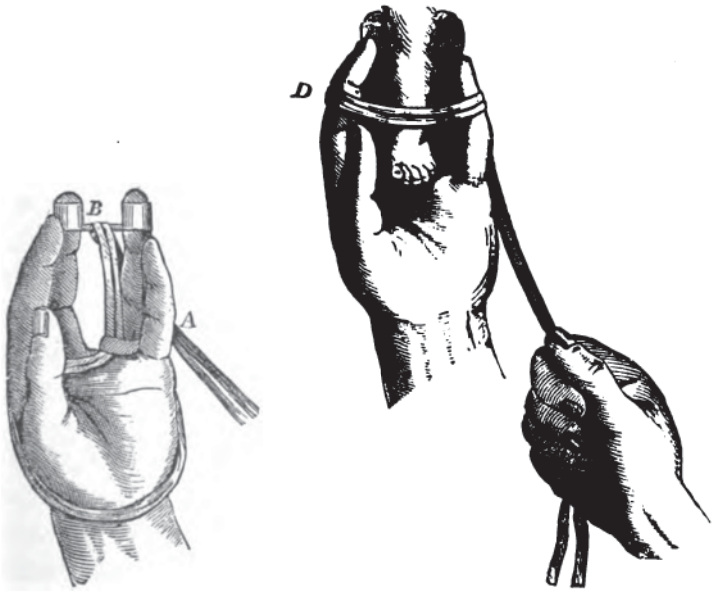


FIG. 24.—HYERNAUX'S INSTRUMENTS.



FIGS. 25 and 26.—MORALES' SLINGS.

The same is true of the forceps invented to carry the loop (Figs. 16 and 17), and those for seizing and bringing down the feet. (Those of Bang, Groning, Nevermann, Lazarewitz.)

Of all the above instruments, the best is the hand. It is not often that the method by the hand fails, and the loop once in place we may make every necessary traction to extract the foot.

III *Evolution.*

Here the obstacles are dependent on fœtal mobility. Whenever the obstacles to evolution are very great, we must desist from version, and resort to embryotomy.

IV. *Extraction of the Fœtus.*

We have already mentioned short and tense cord, and the means at our disposal. We must now study the difficulties offered by the arms and the head. If, indeed, uterine contractions are weak, if the cervix resists delivery, if tractions are made in the pain-intervals, the arms are extended above the head, and this is a grave complication, seeing that the body of the fœtus having been delivered, the infant may endeavor to breathe, and asphyxiates.

1. *Extraction of the Arms.*—The arms may be extended in two ways: either from above below, and from behind in front, or else from above below, and from in front behind, that is to say, crossing behind the neck. We must first determine in which of these two ways extension has occurred, for we must always, in order to extract them, make them follow the same route traversed in extension. The angle of the scapula will tell us this. If the arms have extended from behind in front, the inferior angle of the scapula will be at some distance from the vertebral column, while if extension has occurred from in front behind, then this angle will be near the vertebral column.

Extraction of the arms must be performed gently, beginning with the posterior, for we thus gain space for the extraction of the anterior and more difficult arm. Often extraction of one arm is sufficient, for the other, as we have seen, may be in the vagina, and to prevent the ascent

of this during evolution, a noose is slipped over the wrist and gentle traction made.

In order to extract the posterior arm, the body of the fœtus must be lifted upward by one hand, while the fingers of the other are gently insinuated towards the axilla. The thumb is then placed on one side of the humerus, and the remaining fingers on the other; the fingers are slid along this bone to the elbow. Seizing this joint, the arm is pulled from behind to the front, passing successively over the face and the chest, out

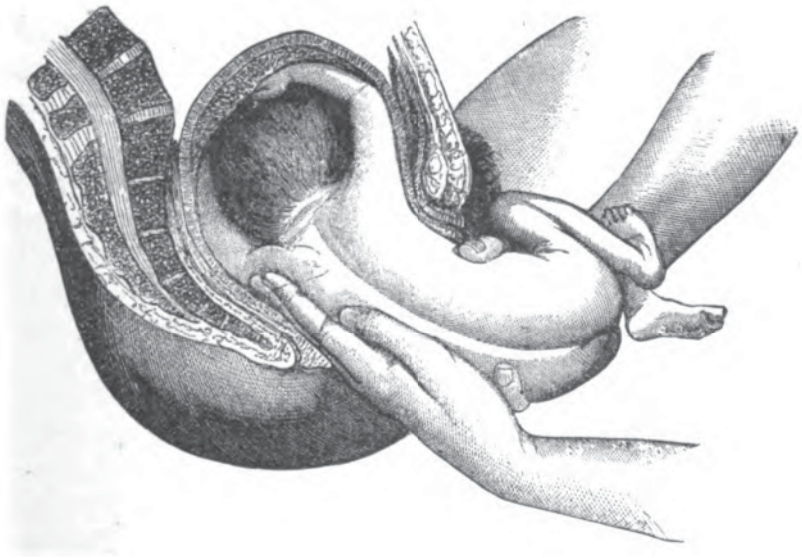


Fig. 27.—Extraction of the Posterior Arm.

at the vulva. (Fig. 27.) In a word, traction should ever be made at the joint, in order not to fracture the bone, and the arm be made to follow the inverse course it took during extension. Where the arm is extended from in front back, the same manœuvre is indicated, except that the arm is passed over the occiput and the neck of the fœtus. This latter form is rare.

The posterior arm disengaged, we turn to the anterior. The body of the fœtus is depressed as much as possible and the arm disengaged in the same manner. In general the left hand is used for the posterior arm, and the right for the anterior. Before extracting the arms, Baudelocque and

Rossirth advise traction on the shoulders, thus approaching the arms one to another, and the neck is more readily accessible.

Hüter recommends the following method: "He seizes with both hands the thighs, lifts them up and brings them together, drawing them more and more towards the maternal abdomen. Then introducing the hand, he finds the posterior shoulder so low, that he can readily reach the elbow and extricate the arm. He then seizes the thorax with both hands, and turns the fœtus on its longitudinal axis, so as to make the anterior arm posterior, and its extraction is easy. A necessary consequence of the elevation of the lower extremities is descent of the posterior shoulder, only we must be careful in lifting up the thighs not to pull so hard as to cause descent of the head, which would greatly complicate matters." This method, it is seen, is only a modification of Naegelé and Grenser's.

Madame Lachapelle, Simpson, Cazeaux and Barnes, have especially drawn attention to the arm behind the head. Barnes believes that it is often the result of inexpertness, while Dugés and Cazeaux believe that this accident may be produced in two ways: either the arm crosses the neck, after it has extended above the head, or else the arm extended along the back and was stopped at the occiput.

When the ventral surface of the fœtus has remained forward until the delivery of the shoulders, extraction of the hands is no longer difficult, as is pointed out by Dubois and Madame Lachapelle. The shoulders are still oblique, and it suffices to extract the posterior arm first. If it is not possible to bring the arm in front of the face and the thorax, Naegelé and Grenser advocate pushing back the elbow to the outside and behind, and at once to extract the anterior arm first.

2. *Extraction of the Head.*—The first obstacle which may offer, is the retraction of the cervix around the neck. If energetic traction is made, the result may be separation of the body from the head. If we do not act rapidly, the child will die. When the fœtus is dead, we can wait for the cervix to relax, but otherwise we must try every means, baths, inunctions of belladonna on the cervix, chloroform, venesection to syncope, etc., to overcome the spasm. If the spasm is limited to the external os, we may try incision of the cervix and the forceps. If, however, the spasm is at the internal os, and we cannot reach it with the fingers to dilate, we must wait till the fœtus is dead, and then resort to perforation or the

cephalotribe. Even when we resort to incision and the forceps, we rarely save the fœtus, for, however quick our actions, the infant has time to make efforts at inspiration, and dies.

Besides this obstacle, there are four difficulties dependent on the manner in which the head engages:

1. Occiput in front, and head flexed.
2. Occiput in front, and head extended.
3. Occiput behind, and head flexed.
4. Occiput behind, and head extended.

1. The head is extracted without the least trouble. It suffices to lift

Fig. 28.—Veit's Method. (Mauriceau's Method.)

the body towards the maternal abdomen, in order to extract the head. The perineum calls for special care.

2. The first thing to do is to flex the head. In 1668 Mauriceau de-

scribed at length the operative method which, to-day, bears the name of Smellie, or of Veit, and which should in reality be called after Mauriceau. (Fig. 28.) The method consists in lifting the body of the fœtus upward with one hand, and applying the index and the middle finger of the other

Fig. 29.—Prague Method, First Stage.

hand each side of the nose, on the superior maxilla, and pulling the face downward the head is flexed. If we do not thus obtain flexion, one or two fingers are introduced into the mouth to the base of the tongue, and using the inferior maxilla as a fulcrum, the face is pulled down. The

head once in the excavation, the two fingers are again placed on the superior maxilla, and while by them we seek to lower the face, the occiput is pushed upward by the index and the middle finger of the other hand, so as to assist in flexion. This once accomplished, the body is lifted towards the abdomen of the woman, and, as in the preceding instance, the fœtus is delivered with its back to the mother's abdomen. Traction should always be made backwards.

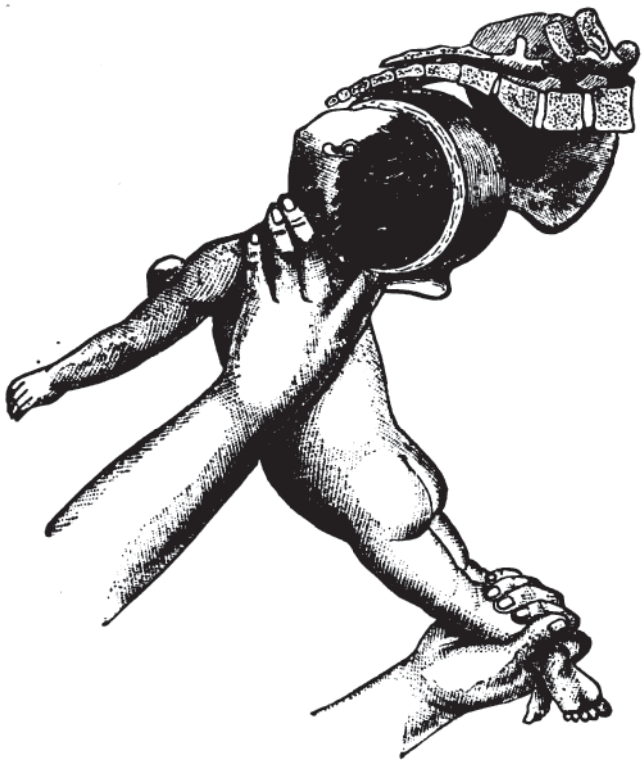


Fig. 30.—Prague Method, Second Stage.

Under the name of the Prague method, Kiwisch and Seyfert have described a process which varies but little from that already advocated by Puzos, and used by P. Dubois. It may be performed in two stages: 1. When the head is high up, the body of the fœtus is carried backward towards the perineum, the fingers are applied over the shoulders, and traction is made downward and backward. If uterine contractions are defective, Kiwisch adds to this traction pressure exercised over the head through the abdominal walls.

Once the head in the pelvis, the other hand seizes the limbs of the fœtus, and lifting the body rapidly towards the body of the mother, keeping up traction through the fingers applied over the shoulders, the fœtus is delivered.

If this method do not succeed, forceps must be applied and the head extracted.

While this method often does succeed, it nevertheless frequently exposes the infant to serious accidents, such as dislocations, fractures of the vertebræ, etc. Hecker, Martin, Gusserow, have cited examples of fracture of the vertebral column, and of decapitation, and Ruge, in his monograph on the fœtal lesions following on extractions in pelvic presentations, reports a number of accidents to which this method exposes the fœtus. Scanzoni, nevertheless, is greatly in favor of a method which saved the lives of 117 infants out of 152 delivered at the Prague Maternity.

Finally, Champetier de Ribes from a careful study of all these methods, and from his own experience, draws the following conclusions: "The best method of making the head pass through the pelvis after delivery of the trunk is: 1. Make the inferior maxilla the fulcrum in order to determine the flexion of the head. 2. At the same time make backward traction. 3. Associate with these manœuvres abdominal expression made by the hand of an assistant, not over the entire head, but more particularly over the frontal region of the fœtus, in the direction of the superior strait."

If Champetier de Ribes has thus been able to cause a head to pass through a pelvis contracted to 2.9 inches, this method ought to succeed where the pelvis is normal.

3. Extraction in these cases is nearly as simple as when the occiput is in front and the head flexed. The body of the fœtus should be carried forward towards the abdomen of the mother. Delivery is thus accomplished belly to belly; only, since the occiput is posterior, we must watch the perineum all the more carefully.

4. In this case, the chin being more or less fixed behind the pubes, to pull on the body before having extracted the chin will only complicate matters. As long as the head occupies the antero-posterior diameter of the pelvis, the chin cannot be depressed. We must then, before attempting flexion, cause the head to rotate. For our part, the only way to obtain a living infant, is to apply the forceps, artificially rotate the head, and

deliver at once. It has been advocated, nevertheless, in these cases, to rotate the head with the hand. Such is the advice given by Madame Lachapelle, and Naegelé and Grenser; but, while Madame Lachapelle immediately extracts the head with the hand, the latter apply the forceps after rotation. The following is the method of Madame Lachapelle: The hand is introduced into the concavity of the sacrum, and surrounds the head until it reaches the mouth, and the index and the middle fingers are

FIG. 31.—EXTRACTION OF THE HEAD. Method of Madame Lachapelle modified by Naegelé and Grenser.

introduced into the mouth, and while the other hand or an assistant pulls on the trunk, the head is made to rotate. At the same time, the attempt is ma e to depress the chin, and to make the head descend. As soon as the chin points backward, flexion is completed and the head delivered as usual. Naegelé and Grenser rarely seize the child by the mouth, but passing the hand around the head to the opposite cheek, and seizing the face in the open palm, they try to bring the head down and at the same

time to rotate it backward. This manœuvre can only succeed where the head is large and the pelvis small.

Finally, in addition to the above complications, version may be rendered difficult by disproportion between the fœtus and the pelvic diameters.

The reader is referred to the subject of contracted pelvis for information on this point.

Frequency and Prognosis of Version.

It is nearly impossible to make any distinct statements in regard to version, for aside from transverse presentations, many authors prefer it to the forceps, while others, and we are of this number, much prefer the forceps when it is possible to use it.

Thus while Sickel found the proportion to be nearly 1.3 in 100 labors, Ricker found it to be .81 in 100, and in 530 cases where the cause was noted, we find:

Transverse presentations, . . .	73.2 per cent.
Placenta prævia, ...	15.4 "
Prolapse of the cord	5.2 "

Ploss, from his researches found: 3,575 versions in 316,891 labors in the German hospitals, or 1 in 88 cases, 214 versions in 67,129 labors, in England, or 1 in 313. In France, 1 in 110.

The following statistical tables show the differences, according to the authority and country:

Versions at the Paris Clinic. (Depaul.)

	No. of Cases.	Mothers.		Children.		No. of Labors.	Mortality.	
		Living.	Dead.	Living.	Dead.		Mothers.	Infants.
From 1852 to 1880.	172	148	24	86	86	21.615	13.9%	50%

[The table has been condensed so as simply to give the totals. A second elaborate table gives the results in the German, Swiss and Russian Maternities from 1789 to 1865. The total number of confinements was 316,891 with 3,575 versions, or 1 in 88 labors.—Ed.]

As for the prognosis, if version, practised at the time of election, that is to say, under the most favorable conditions, is, in general, not a seri-

ous operation for either the mother or for the child, it is not always so, and unfortunately favorable conditions are rarely present in the majority of cases where we are called upon to perform version. (We are speaking now, of course, purely of podalic version by internal manipulation.) The less the amount of liquor amnii, the longer the duration of labor, the greater the contraction of the uterus, particularly if repeated attempts at version have been made, the more difficult the operation, and the graver the prognosis for mother and for child. The more expert the operator, the greater the chances of success. As for the mortality statistics, it is impossible to give accurate figures, for the reason that the cases where version was easy have not been separated from those where it was difficult, nor, further, into classes according to the indication calling for operation. The most we can say is that the infantile mortality is far in excess of the maternal.

From Zweifel's figures we learn that of 53 cephalic versions, 70 per cent. of the children were born alive, and only one mother died; the infantile mortality rate was thus 28.3 per cent., and the maternal 2 per cent. These figures seem high, but many of the versions were performed during labor by Braxton Hicks's method; whilst cephalic version as we practise it, purely by external manipulation made during pregnancy only, is absolutely inoffensive both for the mother and the fœtus.

Podalic version, internal, is, on the other hand, more serious. According to Zweifel, of 3,475 cases, 1,434 infants, 41.2 per cent. were born alive, whilst 58.9 died. Of 3,475 versions, 8.4 per cent. of the mothers died.

Madame Lachapelle lost one child out of every 3.96; Carus, Osiander, Kiwisch, Michaelis, 1 out of 2; Ricker, 1 out of 10; Hüter, 1 out of 14; and Churchill, out of 542 versions, taken indiscriminately, lost 1 child out of 3 and 1 mother out of 15.

Sickel, out of 447,163 children, noted 3,781 versions—that is to say, 1 out of 118.10; of which 3,703 were podalic version, by one or two feet,—1 out of 120.28; and 78 cephalic, 1 out of 5,732; of 3,475 infants born by podalic version, 1,434 were born alive, and 2,041 dead. Of the same number of mothers, 3,184 were living and 291 dead.

The reason for the gravity of this operation is evident, when we remember the complications and the obstacles which we have noted. Whenever, then, there is room for choice, we much prefer the forceps to version. The forceps, in skillful hands, is an inoffensive instrument.

Version, in skillful hands, is always a serious operation, and we cannot better impress this than by repeating the words of our master, Depaul: "With my forceps, I am perfectly at ease, for I am sure of never doing harm, while I never perform version without apprehensions." We must remember, however, that what complicates version is the extraction of the fœtus. Aside from traumatic lesions to which it is liable, the gravest danger for the fœtus is the retention of the head and the consequent asphyxia. Therefore certain authors have endeavored to make the infant breathe, while the head is still in the pelvis. Pugh advocated introducing two fingers into the mouth, forming a gutter with the hand for the air to pass along, and later devised a special canula for bringing the air to the fœtus. Similarly with Weidmann, Hecking, Blick, the younger Baudelocque.

All these methods seem to us theoretical rather than practical, and we had better spend all our time in extracting the fœtus. The same criticism applies to the proposal of Wigand and of Ritgen, to apply a ligature to the cord as soon as the body is born, and thus to prevent cerebral anæmia. It is not anæmia which kills, but asphyxia, and again, therefore, the best remedy is to deliver the child as soon as possible.

We append Pajot's table, wherein are resumed the rules for podalic version.

Pelvic Version after Pajot.

We must not think of version unless: the os is dilated or dilatable: the head must be above the brim: intact membranes are favorable.

Version is indicated whenever the life of the child or mother is in danger. When circumstances allow of choice, forceps should be preferred.

Version may be divided into:

1*st Stage.* Introduction of the hand and search for the foot. Manipulate only in the pain intervals.	Introduce hand, cone-shaped, into vagina: Rupture membranes: Enter uterus gently: Seek the feet by the shortest route: Seize the feet—one is enough. The diagnosis of position has been made, if possible, beforehand.	1*st. Position not known:* Endeavor to make out as exactly as possible. 2*d. Narrow vagina:* Not serious. 3*d. Arm in the vagina:* NEVER AMPUTATE. *If version is possible*, a loop around the hand to prevent retraction during evolution. *If version is impracticable*, embryotomy. 4*th. The fœtal part is in the way:* Push it up. 5*th. The feet cannot be found:* Hunt for them along the lateral and posterior surface of the fœtus. Pass the hand to the fundus and search carefully, but thoroughly.

2nd Stage. **Evolution.** **Same in regard to manipulations.**	Extend the leg gently: Pull the foot to the vulva, bending the fœtus on itself, so as to bring the vertex to the fundus, and the back towards one of the cotyloid cavities.	*Uterine contraction* about the only obstacle. If the head tends to engage with the feet or foot, noose over the feet, and push the head up with one hand, while making traction on the noose by the other.
3rd Stage. **Extraction.** **Manipulate only during contractions — *except in emergency,* inertia, hemorrhage.**	Wrap the foot, or feet, in a towel: Make traction in the axis: Seize the parts near to the mother: Be careful of the cord: If the arms make exit spontaneously, simply lift forward the body.	1*st. If it is impossible to finish with one foot, bring down the other,* placing first a noose over the first. 2*d. Extension of the arms over the head:* Bring down the posterior arm first. 3*d. The head does not rotate:* Cause artificial rotation. 4*th. The occiput is in the sacral excavation:* Head flexed—carry the back of the fœtus backward. Head extended—carry the fœtus towards the belly of the mother. If extraction is impossible—forceps.