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ON

THE TREATMENT OF LABOUR

DELAYED BY OBSTRUCTION AT THE PELVIC BRIM.

BY

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ON THE TREATMENT OF LABOUR, ETC.

As a preliminary to my remarks on the treatment of labour delayed by obstruction at the pelvic brim, it will be necessary to define the nature of this obstruction. It must be remembered that an abnormally large head may be obstructed at a normal brim; but the treatment of such a case will not be materially different from that for a case of labour where an average head is detained at a contracted brim. Not to complicate the question unnecessarily, I shall also omit all mention of cases where the brim is contracted, only or mainly, in the transverse diameter. Of such cases I have met with several examples. They are not numerous, however, and I shall not consider them in this paper. Obstruction in the *conjugate* diameter, on the other hand, is a most common cause of delay in labour; and, to the treatment of delayed labour from this cause, so much attention has been directed by the ablest obstetricians of the day, that I feel almost as if I might justly be blamed for "rushing in" where I ought to "fear to tread." But as I have, in the course of my hospital and other practice, seen many cases of this nature, and as the subject seems to me to require further elucidation, I feel that by bringing this question before you early in our first session, I shall be giving our young Society an early opportunity of showing that we can contribute something to the advance of Obstetric Science. Almost every Fellow of this Society must have some experience of cases of delay of the head at the pelvic brim, and I lay my views before you, not dogmatically for your acceptance, but tentatively for your criticism, though naturally with the hope that my propositions may meet with your approval.

I have mentioned that I wish to confine myself to the discussion of cases where the obstruction is in the conjugate diameter. Now in pelves with this deformity we may have the transverse diameter *proportionally* diminished, thus giving what is called a *generally contracted pelvis.* We may also have what is called the *flat pelvis,* this being either a normal pelvis flattened, or a generally contracted pelvis flattened. Arranging these, say, in the order of their interest, we have—first, the *simple flat pelvis;* second, the *generally contracted pelvis;* and third, the *generally contracted flat pelvis.* I have specimens of these three deformities here, and also

a normal pelvis to compare them with. Clinically, these agree in the fact that the sacrum, projecting forwards at the brim, is generally more or less within reach of the examining finger; whereas in the normal pelvis the finger cannot possibly reach this projection. The consequent diminution of the conjugate diameter varies from a slight and clinically unimportant decrease to a contraction which may be called absolute. In the very slight degrees of contraction there will be no delay which cannot be overcome by the ordinary powers; whereas in the absolute contraction there will be such an obstruction as to prevent absolutely, under any circumstances, the passage *per vias naturales* of a viable child. Having thus narrowed our discussion to these limits, we necessarily eliminate on the one side, "patience," and on the other, Cæsarean section and allied operations, from the present inquiry.

I have just stated that this kind of contraction can be diagnosed by finding that the promontory of the sacrum is within reach of the examining finger, where the deformity is so decided as to come within the above limits. But how are we to ascertain to which of the three kinds of contraction a given case belongs? This is easily done, though not with the most desirable accuracy, by taking certain external measurements of the false pelvis, the only instrument required being an ordinary pair of callipers. We find that, in the normal pelvis, the distance between the anterior superior spines of the ilia is 10 inches; that between the crests at their broadest part being 11 inches. In a generally contracted pelvis these figures will be both diminished, and nearly equally so, giving us, say, 9 and 10 inches respectively. When, however, a pelvis becomes flattened from before backwards, narrowing the conjugate diameter only, as in the rickety pelvis, the *relative* distances of these points become altered, the crests being approximated whilst the distance between the spines is increased. This will obviously hold in flattening of both the normal and the generally contracted pelvis. I find, it may be worth mentioning, that in the living subject these measurements generally appear under rather than over the true ones. A correct estimate of the internal conjugate is more desirable than attainable, for internal pelvimeters are not of much service. But a fairly accurate estimate of this diameter may be formed by measuring with the index finger of either hand the distance between the sacral promontory and the lower end of the symphysis pubis, and deducting from this *lower*, or *diagonal* conjugate, as it is called, about three quarters of an inch. The exact nature of pelvis we are dealing with is important when we consider the mechanism of labour in such cases; for the head, as we shall see, disposes itself, as a rule, differently at the brim in the flat from what it does in the generally contracted pelvis. We know that in normal labours the head at the brim is found, as soon as labour pains have begun to tell on it, more or less flexed, the sagittal suture being in one of the

oblique diameters and in the axis of the brim. This may still obtain in the generally contracted pelvis. In the flat pelvis, however, the head lies in an extended position; and, if we reflect that, when in the transverse diameter, before flexion can take place, the parietal protuberances must have cleared the brim, we shall see that no other position is possible. But besides this, you will find on placing a fœtal head over the brim of such a pelvis that the broadest part of the head (the biparietal diameter) is placed to one side of the promontory—where alone, in fact, it can find room which seems almost made for it. In moderate degrees of this deformity, again, the vertex of the head will be considerably below the plane of the brim; but in very severe contraction the vertex will be more nearly in the plane of the brim. The head in the flat pelvis, again, whilst having its antero-posterior diameter in the transverse diameter of the pelvis, will have its sagittal suture lying nearer to the sacrum, however, than to the pubes.

A few words here as to certain diameters of the head, and the relations of these diameters to the antero-posterior diameter of the flat pelvis, will not be inappropriate, since I find, in the writings of otherwise precise men, so much laxity in this matter, that I can only conclude either that they are not very clear on the point themselves, or that having a vague way of putting what is clear to them, it is often impossible for their readers to understand what they mean to teach.

We have two transverse diameters of the head quite distinct from each other. One of these is the coronal—the greatest distance between the two sides of the coronal suture. I prefer to call it the coronal, and not the bitemporal, the name this diameter usually receives, for when thus named it is apt, I find, to be confused with the bimastoid, with which it has really nothing whatever to do. The other of these transverse diameters is the biparietal—the distance between the two parietal protuberances. Now these diameters indicate the greatest breadths of the cranium at different portions of it, and they are about $1\frac{1}{2}$ inch apart. The measurements of these diameters *at the base*, viz., the bizygomatic and the bimastoid, are less than the corresponding diameters in the cranial vault; and the anterior pair of diameters are individually less than the corresponding diameters posteriorly. Through the kindness of Professor Cleland of this University, who made the coronal section specially for me, I am happily able to show two tracings of sections of a nine months' fœtal skull, as nearly as possible through these diameters, showing the two anterior and the two posterior diameters. The measurements will be found to be as follows:—

Bizygomatic, $2\frac{5}{8}$.	Coronal, $2\frac{7}{8}$.	Increase, $\frac{2}{8}$.
Bimastoid, $2\frac{3}{8}$.	Biparietal, $3\frac{3}{8}$.	Increase, $\frac{4}{8}$.

Only one other diameter—but this time a pelvic one—must be

borne in mind. As this diameter has not been recognised as such, so far as I know, though its posterior pole has often been referred to, it may simplify matters if I give it the name of *lateral conjugate* diameter of the brim. It is *an* antero-posterior diameter, but lies, as its name implies, to either side of the true conjugate, and not always strictly parallel to it. I find that in contracted pelves this diameter measures *from a quarter to half an inch* more than the true conjugate. Each lateral conjugate will obviously be of the same length, unless the brim is irregularly contracted. The posterior pole of this diameter will be at the inner portion of the ala of the sacrum, and the anterior pole will be at some part of the pubic bone immediately behind its crest.

Viewing the head now in its relation to the brim of a flat pelvis, on which the vertex is resting, we are able to put the matter briefly thus: the head is extended with its long diameter in the transverse of the pelvis, its coronal diameter in the true conjugate of the pelvis, and its biparietal in the lateral conjugate of the pelvic brim. When the *base* of the cranium rests above the brim, the head is still extended, and has still its long diameter in the transverse of the pelvis; but now its bizygomatic diameter is in the true conjugate, and its bimastoid in the lateral conjugate. In the generally contracted pelvis, when the disproportion is decided, the head will have, whether vertex first or base first, substantially the same position as the above, but it will occupy equally the two sides of the pelvis. It will also have the Naegele, but not necessarily the Michaelis obliquity. If, however, the disproportion be not great, the head can then assume a flexed position, and lie in an oblique diameter of the pelvis. I feel satisfied I am right as to these two different positions of the head *in the generally contracted pelvis*, though I am unable to name any authority in support of these views.

I know from having placed the head of a still-born child at the brim of a generally contracted pelvis, which it filled *completely*, that the head naturally took up its position and passed the brim, as in the flat pelvis, that is, extended, and in the transverse of the pelvis, whether drawn through vertex first or base first, instead of lying in the oblique diameter of the pelvis. If a fœtal skull be placed at the brim of the generally contracted pelvis, which it does *not* occupy to the full extent, it will, I find, occupy an oblique diameter. Generally contracted pelves are not, however, *all* necessarily *strictly* "æquabiles," but incline either to the flat or the malacosteon type. And according as such pelves incline to the flat will the head lie in transverse and extended; whilst if they incline to the malacosteon type, it will lie more naturally in the oblique and flexed.

Thus far my remarks have been preliminary, and I trust I have made them sufficiently clear for you to follow me next, whilst I consider the question as to where we at present stand in the

matter of treatment, and, finally, when I offer you my views as to the settlement of this most important and difficult problem.

This subject has, especially in recent years, been largely engaging the attention of obstetricians, but the writer who has done most towards attempting its practical solution is the late Sir James Y. Simpson. His papers on "Turning as an Alternative for Craniotomy and the Long Forceps in Deformity of the Brim of the Pelvis" impress me as a wonderful illustration of most elaborate and skilful pleading. Simpson's arguments have powerfully influenced subsequent writers; but, notwithstanding this, their practice has, to my mind, led at least some of them to speak as if they had been "convinced against their will." The question still resolves itself into the adoption of one of these three plans,—Turning, Forceps, and Craniotomy; and the following quotations will serve to indicate how far we are still from having settled the question, and how much uncertainty exists in the minds of even the highest authorities as to the proper mode of treatment.

Dr Goodell, the great American advocate for version, says,[1] "Cases there are in which turning cannot and should not be performed. Again, the urgency after that operation for immediate delivery is a strong argument against its indiscriminate use. Turning should generally be preferred to the lashing of the forceps handles. In pelves uniformly contracted, the forceps is the better means of delivery. In pelves narrowed in the conjugate diameter, turning should be resorted to whenever a half hour's faithful trial with the forceps fails to make the head engage. In pelves whose conjugates range from 2·75 to 3·25 inches, turning should be the initial step."

Dr Ramsbotham,[2] eight years after the first appearance of Simpson's papers on this subject, writes, "My own opinion is that, in the great majority of cases where craniotomy would be necessary, if the vertex presented, the same operation would be required after the shoulders were extracted; and that, therefore, the advantage to the child must be regarded as very limited. The pressure to which the funis umbilicalis must inevitably be exposed during its transit is peculiarly hazardous to the child. It is impossible to introduce the hand into the uterus and turn a child, even when the promise appears most favourable, without compromising the woman's security to some extent. In obstetric surgery there are some operations performed by the hand, equally dangerous as, or even more so than ordinary instrumental delivery."

"My own impression," says Dr Playfair,[3] "is that the use of the forceps will generally be found to be preferable to the original choice of turning. Where the head refuses to enter the brim, and cannot be sufficiently steadied by external pressure to admit of an easy application of the instrument, turning is simpler and

[1] *Amer. Journal of Obstetrics*, 1875-76, p. 215.
[2] *The Principles and Practice of Obstetric Medicine and Surgery*, p. 222.
[3] *The Science and Practice of Midwifery*, Third Edition, vol. ii. p. 79.

safer. After turning moulding cannot be continued beyond five minutes without proving fatal. This, however, is no reason why turning should not be used after the forceps and the natural efforts have proved ineffectual."

"The measurement of the pelvis," remarks Dr Matthews Duncan,[1] "and especially the measurement of the conjugate, even if accurately made, is not the criterion of the mode of delivery to be adopted at the full time, or if premature labour is induced. In the same woman conditions may vary in different labours; and, in different cases of the same dimension, conditions may vary, so that at one time perforation may be the right operation, and at another time turning may be the right operation; and I may state to you that turning, or rather delivery by podalic extraction after turning, is not to be resorted to unless you have a rational prospect of getting a living child. If your delivery by turning ends in the delivery of a dead child it is, to a considerable extent, a failure; it would have been better to perforate—safer for the woman."

It is the opinion of Dr Leishman,[2] that the forceps "in skilful hands is a safer operation to the mother. When the decision lies between turning and craniotomy," Dr Leishman says, "we must first be sure that, if we succeed in turning, the head can be got through the contraction; for it sometimes happens that, after turning, delivery can only be accomplished by perforating behind the ear. It must, therefore, be obvious that it would be better to perforate and deliver at once than to turn and then perforate, thereby subjecting the woman to a two-fold danger. The operation of turning, however," he adds, "when it can be effected, even after some time, and with some difficulty, is, there is good reason to believe, more safe to the life of the mother than that of craniotomy; so that, even when the child is dead, it is often to be preferred."

Dr Churchill,[3] expresses himself thus:—"Lastly, even if we succeed in selecting a suitable case and in extracting the child, it has yet to be proved that the mother would not incur considerable danger from contusion or laceration in forcibly dragging the child through a narrow pelvis; for I must remind my readers that we have no statistics of the proposed operation to compare with those of the old method, the few cases adduced by Dr Simpson being of no value for this purpose. At the same time I do not mean to deny that there are some cases in which it may be worth trying, as every successful case is a rescue of a life from destruction."

Dr Braxton Hicks,[4] an advocate for version, acknowledges that there is a risk of bruising and rupturing the uterus in attempting to save the child. If considerable doubt as to the result with the forceps, he would always prefer version; adding, "where

[1] *Clinical Lectures on the Diseases of Women*, p. 24.
[2] *A System of Midwifery*, Second Edition, pp. 521–522, 580.
[3] *On the Theory and Practice of Midwifery*, Fourth Edition, p. 312.
[4] *Guy's Hospital Reports*, 1870, p. 503.

there is a fair chance of the forceps succeeding I should always try it first."

Dr Schrœder,[1] "would distinctly caution the young practitioner not to rely upon the forceps when the head is high up in the contracted pelvis. We recommend," he says, "version in all cases of pelvic contraction where this is not absolute. Our reasons for doing so are—(*1st*), in the interest of the mother; (*2nd*), in very great pelvic contraction with a conjugate diameter of 7¼ centimetres (2·8 inches) we have extracted live children; and (*3rd*), because perforation of the aftercoming head is neither more difficult nor more dangerous to the mother than that of the presenting head."

Dr Spiegelberg[2] insists that, "in contraction of the pelvis it will *often* be necessary to perforate; version must be reserved for certain cases, and the use of the forceps *rejected*."

The advice of Dr Caseaux is, "So long as any chance exists for the child version should be tried."

"At the present moment," says Dr Barnes,[3] "it may be said that the chief advocates of turning are those who do not realize the advantage of a good long forceps. There are certain cases of deformed pelvis in which turning is certainly the best both for mother and child. The skill of the operator will in many cases determine his choice. If we fail after version, and have to perforate, we save the mother and have tried to save the child. There is no difficulty nor danger in perforating the aftercoming head. Assuming a standard head, the base of which unyielding measures three inches, this is obviously the limit beyond which the operation would be useless; for although the head is caught in the bitemporal diameter, a little in front of the biparietal diameter, the base must be exposed in its full width to the narrow strait. Even if the side of the head be indented by the promontory, no important degree of canting or obliquity can be counted upon. But if the head should be undersized or unusually plastic, there is a fair prospect of the child being drawn alive through a conjugate diameter measuring three inches."

Dr James Wilson[4] says, "Dr Simpson gives reasons for the preference of turning to craniotomy which appear to me quite incontrovertible."

Dr Lusk[5] declares that "so long as the head does not engage at the brim there is no rivalry between version and forceps. The latter should be placed under the ban as hardly less dangerous than the Cæsarean section." He, however, according to Dr Hodge,[6]

[1] *A Manual of Midwifery*, pp. 260-262.
[2] *Obstetrical Journal*, 1874-5, p. 392.
[3] *Obstetric Medicine and Surgery*, p. 672.
[4] *Glasgow Medical Journal*, 1856, p. 398.
[5] *The Science and Art of Midwifery*, p. 475.
[6] *American Journal of Obstetrics*, 1875-6, p. 17.

'concludes from his extensive review that the experience in Germany is decidedly in opposition to Simpson's views."

"It has been said," writes Dr Hodge,[1] "that success justifies the means, but how a practitioner can be justified in a protracted case of delivery where the waters have been long evacuated and the body of the uterus firmly contracted upon the body of the child and placenta, and when a portion, if not the whole, of the presenting part has passed the circle of the os uteri, in attempting version, is inexplicable. No latent hope that the child might possibly be saved under these circumstances can compensate for the immense risk to the mother."

"The relative value," says Dr A. R. Simpson,[2] "of two of the most important of these operations, viz., the operation of podalic version and extraction, and the operation of delivery with the long forceps, has never yet been finally determined." "In the great run of cases of flat pelvis where the condition is timeously recognised, delivery ought to be brought about by turning."[3] Again, he states, that in the generally contracted pelvis, "the clear indication is for delivery by the forceps."[4]

In giving these quotations, I have been influenced by a desire to indicate what the practitioner, who has no opportunity to investigate this difficult question for himself, has to guide him, and to show that not only does one authority differ from another, but that the inquirer is often left in doubt as to what he is really advised to do. And here let me say that where no authority is given for any new statement I may make, it must not be inferred that I am taking, or wishing to take any credit for it, but simply that if brought forward previously by another I was not aware of such being the case. I thus, though intending to claim no originality, am ready to accept full responsibility for any statement made by me without quoting an authority for it. I have made no attempt at reading everything that every one before me has written on this subject, my life being too busy a one to make this possible, even if I did think it profitable.

I shall now take up the principal arguments used by Simpson, and shall endeavour after each to give my estimate of its value as a means of ascertaining the true position of version as compared with forceps and craniotomy in contracted pelves.

First,[5] "The fœtal cranium is of a conical form, enlarging from below upwards, and when the child passes as a footling presentation, the lower and narrower part of the cone-shaped head is generally quite small enough to enter and engage in the contracted pelvic brim."

[1] *American Journal of Obstetrics*, 1875–6, p. 20.
[2] *Contributions to Obstetrics and Gynæcology*, p. 172.
[3] *Ibid.* p. 170. [4] *Ibid.* p. 166.
[5] *Selected Obstetric Works*, p. 408.

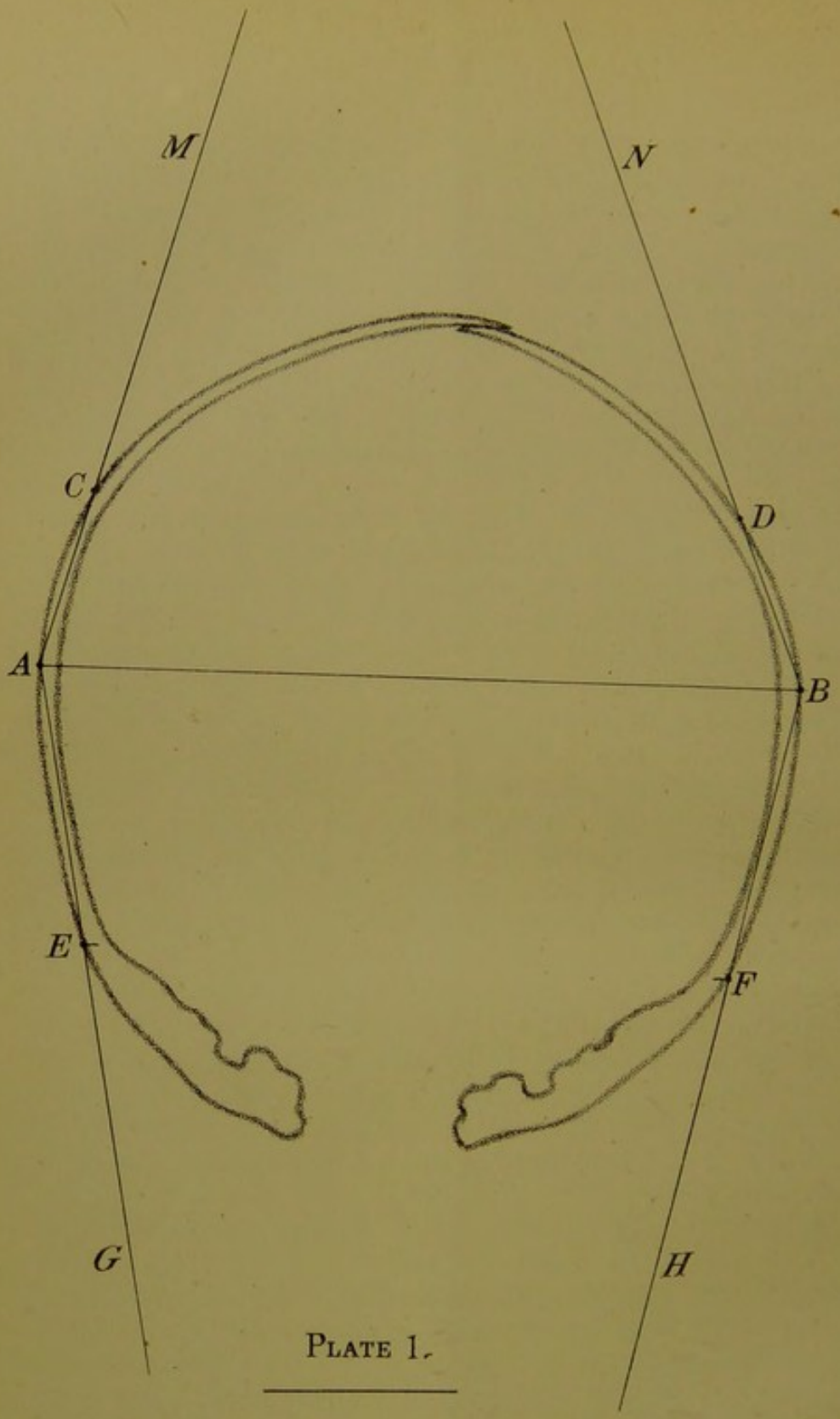

PLATE 1.

Vertical section of Cranium of nine months' fœtus through the Bi-parietal diameter; natural size.

A B—Bi-parietal diameter.

E F—Bi-mastoid diameter.

C D—Equal to Bi-mastoid diameter.

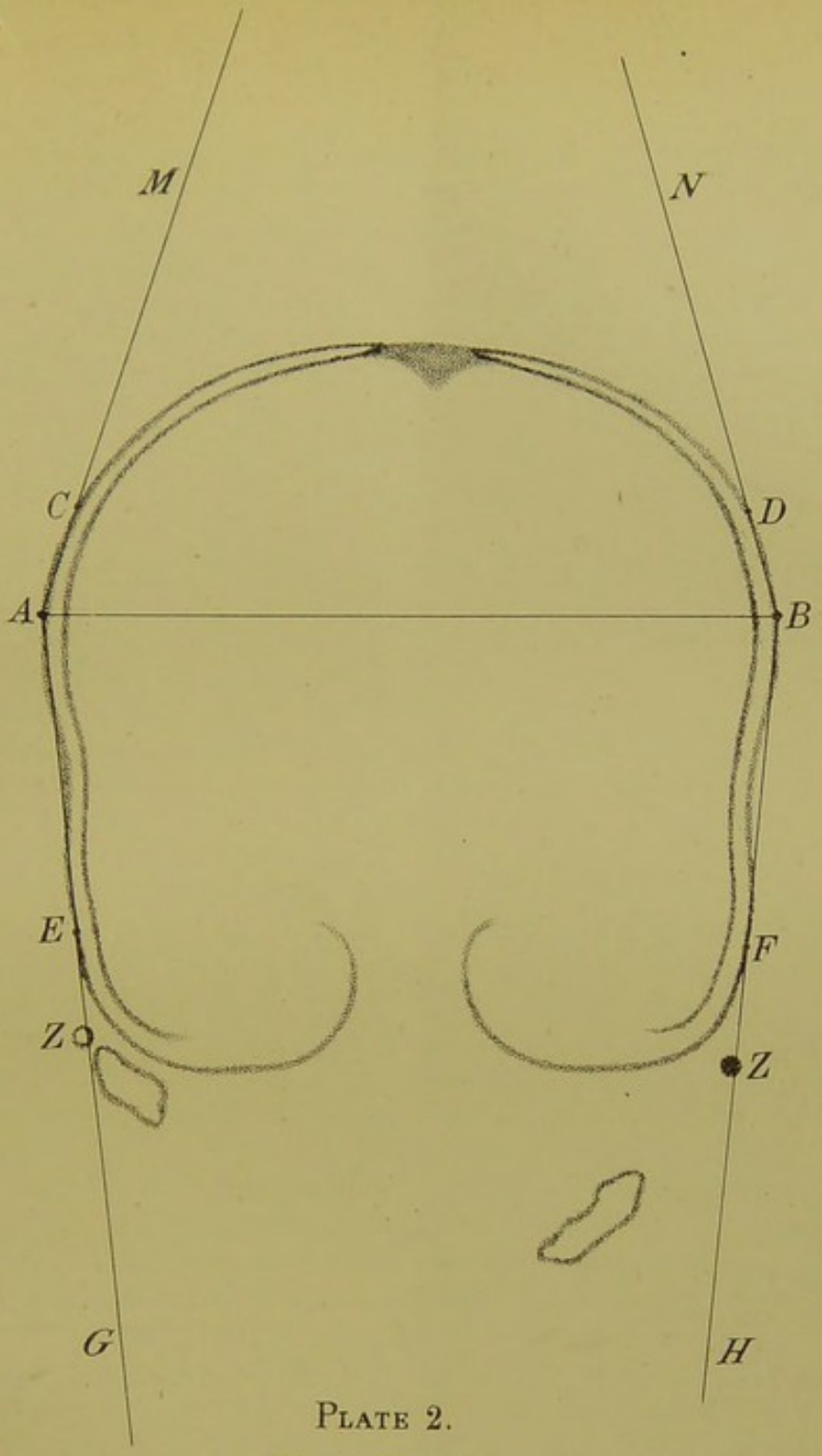

PLATE 2.

Section of same Cranium through Coronal diameter; natural size.

On the left side the Saw has cut through the root of the Zygoma, but the position the Zygomatic process would have had is indicated by a small circle.

A B—Greatest Coronal diameter.

Z Z— Bi-zygomatic diameter.

E F and C D—Equal to Bi-zygomatic diameter.

This to my mind is the great argument in favour of Simpson's position, but I am unwilling to give it the full weight which he attaches to it. It may be pointed out that the vertex is not, strictly speaking, "the basis of the cone of the head,"[1] but the apex of another cone, having its base the same as the lower cone, viz., the level of the parietal protuberances,—the head being thus divisible into two cones lying base to base. And, unless in exceptional cases, we find that the head, when presenting, has a not inconsiderable portion of its vertex below the level of the brim, thus giving full effect to its wedge-like form there.

A reference to the Plates, showing the coronal and parietal sections of the fœtal head for the nine months' fœtus, will show to what extent that part of the head above the greatest transverse diameters is of the nature of a cone as well as that below. Let AB (Plate I.) be the biparietal diameter, which in this case measures 3¼ in.; EF the bimastoid, measuring 2¾ in.; and CD the portion of the vertex which will be caught by a conjugate diameter measuring also 2¾ in. In these Plates I have converted the portions of the cranium above and below the broadest diameters into their corresponding truncated wedges, reckoning the sides of the wedges to pass through points C, D, E, and F, where a conjugate, which would admit the rigid base, would impinge, and compression would begin. MABN and GABH, in the two Plates, represent these wedges. Now, by measuring the angles at the base of each of these four wedges, and taking the mean of each pair of angles, I find that the *mean average slope* of the upper cranial wedge (Plate I.) is 71¼ degrees, that of the lower being 78¼; and, since the "wedge-power" (here, in the sense not of power to cause expansion, but of capacity for being compressed) is directly as the size of the angles at the base of the wedge, the wedge-power of the upper is not so very much less than that of the lower wedge. In Plate II. the mean average slope of the upper wedge is 73¼ degrees, that of the lower being 84¼. The value or wedge-power of the upper is, therefore, quite comparable to that of the lower wedge. We thus see that instead of the upper part of the head being looked on as a flat surface, it differs as a cone exceedingly little from that whose truncated apex is the base of the cranium. A reference to Professor Cleland's paper[2] "On the Form of the Human Skull at Different Ages," will show that if we wish to have a child whose head will be an inverted truncated cone, as described by Simpson, at its birth, we must keep that child in utero till it has reached the age of twelve years.

Dr Hodge endeavours to reply to this argument of Simpson's also, but it is apparent that he has not hit the mark, for he speaks as if the *occiput* entered the brim first, failing to see that this is impossible in the flat pelvis.

[1] *Selected Obstetric Works*, p. 401. [2] Proc. Phil. Soc. Glasg., March 1885.

The exceptional cases, in which the head seems to rest on the pubis rather than in the brim, and thus deprive the vertex of any benefit that it might have from its wedge-like nature, are explained by Dr James Wilson to arise, not from the conjugate being so small as to prevent entirely the descent of the apex of the upper wedge of the head, but from an abnormally great inclination of the pelvic brim, in which the sacral promontory lies nearly *over* the pubis. As I do not think that this species of pelvic brim has been recognised by obstetric operators as bearing on the question of treatment, I give Dr Wilson's[1] quotation from Bland:—

"Although the sacrum may project so much or advance into the pelvis so far as to reach within two or three inches of the pubis, consequently the entrance into that cavity would be only of that diameter if the bones were directly opposite to each other, yet the pubis being placed something lower than the greatest projection of the sacrum, and opposite to a part of that bone that diverges backward, the real distance between them may be much more considerable than to the touch it may seem to be; whence it happens that in cases where the projection of the sacrum has occasioned exceeding great difficulty in the beginning of the labour, opposing an almost insuperable bar to the entrance of the head of the child into the pelvis, by directing it too far over the pubis, yet when that direction has been altered by the crotchet, or by any other means, and the head brought into the line of the centre of the pelvis, the conclusion of the labour has been frequently effected with very little exertion or force."

Dr Wilson[2] further remarks on this subject, "In all these deviations the labour must be affected less or more, unless the belly of the woman is pendulous, carrying the uterus so far forward as to make its axis correspond to the altered axis of the pelvic brim. In the higher degrees of obliquity, as in those cases referred to above, when the obliquity appeared to be not less than 80 degrees, I am fully convinced that nothing except turning can possibly save the child from its destruction by the crotchet."

Besides the influence this kind of brim will have in preventing the head from entering it, it seems to me that it is in such cases and from such a cause that the posterior parietal bone is the presenting one.

Second,[3] "The hold which we have of the protruded body of the child, after its extremities and trunk are born, gives us the power of employing so much extractive force and traction at the engaged fœtal head, as to make the elastic sides of the upper and broader portion of the cone (namely, the biparietal diameter of the cranium) become compressed, and, if necessary, indented, between the opposite parts of the contracted pelvic brim, to such a degree as to allow the transit of the entire volume of the head."

[1] *Glasgow Medical Journal*, 1856, p. 398. [2] *Ibid.* [3] *Loc. cit.*, p. 408.

I have no objections to this proposition, with the exception of the statement that the *biparietal* diameter of the cranium becomes compressed, the fact being that the biparietal diameter is never the diameter which is compressed by the conjugate in flat pelves. I would also add that if it is inferred that the hold in head last cases is better, and the extractive force greater than with the forceps, this can only be true if the forceps are wanting in proper length and strength. I cannot admit either that, though the hold is good, the safety of the child's neck is not, to some extent, endangered by the traction. Dr Goodell's plan, however, of applying a *vis a tergo* to the head diminishes this danger very materially.

Third,[1] "The lateral and very temporary compression of the fœtal head by the contracted sides of the pelvis, such as we can produce and effect on artificial turning and extraction, is less dangerous to the life of the child than its oblique or longitudinal compression with the long forceps."

To this I would say that we should have some evidence as to danger from *antero-posterior* compression of the head. Is the usual compression in an ordinary case of protracted labour not largely in the *antero-posterior* diameter? Is the "sugar-loaf head" not an illustration of antero-posterior or sub-occipito-frontal compression and consequent occipito-mental elongation?

Fourth,[2] "In the mechanism of head cases the neck, as is well known, becomes early flexed in the labour, so that the chin is brought towards the top of the sternum, and the vertex or upper and back portion of the head first becomes pushed downwards into the pelvic aperture, and thus constitutes the presenting part—in other words, the broadest part of the cone of the whole child, because the broadest part of the head or its biparietal diameter is thus naturally first driven downwards into the pelvic cavity, and is first directed against the contracted brim."

Now, the head has only to be placed at the brim of a *sufficiently contracted* pelvis to see that, *whether as vertex first or base first* the head *must* lie with its coronal or neighbouring diameter in the conjugate diameter of the pelvis, and in *an extended condition*, the parietal protuberance being to one side of the promontory. This will be found to be the case in the flat pelvis, and where the disproportion is sufficient in the generally contracted pelvis also, as has been previously pointed out. But let the head be flexed, as it sometimes is, in the generally contracted pelvis, and it will be found that the more this is done the more is the biparietal diameter brought into the line of the conjugate of the brim, although even with the greatest amount of flexion this broadest diameter in the moderate degrees of the generally contracted pelvis, as in the normal, *is never absolutely in the true pelvic conjugate, on account of*

[1] *Loc. cit.*, p. 494. [2] *Loc. cit.*, p. 405.

the long diameter of the head lying in the oblique diameter of the pelvis, thus throwing the posterior parietal protuberance to one side of the promontory of the sacrum. In the flat pelvis, however, and in the greater degrees of generally contracted pelves, since the head lies in the *transverse* diameter of the pelvis, flexion would necessitate the biparietal diameter being thrown *completely* into the line of the true conjugate of the pelvis.

Dr A. R. Simpson[1] acknowledges that in the flat pelvis, with the vertex first, flexion really does not take place, but rather increased extension by descent of the forehead. But he evidently still looks on the biparietal diameter as requiring in some part of its course to pass the narrow conjugate, remarking, "The left parietal bone then rounds the promontory, with its protuberance to the left *of the most projecting part of the promontory*, and as it is squeezed past this point, it may receive an indentation towards its anterior extremity."

Lusk, who quotes largely from Litzmann and Michaelis, on this point falls into the same error; for, after describing the partial descent of the sinciput, he adds,[2] "By the time, however, the bitemporal diameter becomes fairly fixed in the conjugate, the anterior fontanelle moves upward and forward towards the side-wall of the pelvis, while the small fontanelle sinks downward, and occupies a position near the centre of the cavity. This movement is not simply a crowding of the entire head in the direction of the brow, but is due to a rotation of the head upon an axis furnished by the conjugate diameter, the symphysis and the promontory furnishing the pivotal points. By the time, in the rotation of the head upon its fronto-occipital diameter, the posterior boss reaches the level of the promontory, the largest circumference of the child's head has already engaged in the straitened brim, and the influence of the pelvic flattening upon the mechanism of labour ceases." Here we have, after descent of the brow, a movement of flexion in bringing the posterior parietal boss towards the middle line, and to the level *of the promontory.* His explanation as to how the parietal boss gets past the promontory is, that already the greatest circumference of the child's head has passed the brim by the previous descent of the anterior parietal boss, and therefore there is no difficulty now in the posterior parietal protuberance clearing the promontory. He *may* mean that the biparietal diameter passes in the *lateral conjugate*—that is, entirely out of the influence of the promontory—but he does not make this plain, if he even thinks of it as so passing into the cavity.

Nor is it necessary to infer what Dr Lusk means on this point; for, that he considers the parietal boss to require in the flat pelvis, at some part of its transit through the narrow brim, to be forced round the promontory, and not at its side, is made certain at page

[1] *Contributions to Obstetrics and Gynecology*, p. 170.
[2] *Science and Art of Midwifery*, p. 452.

457, where, indeed, he gives an illustration, borrowed from Dohrn of a fœtal cranium, which in passing through the brim of a "simple flattened pelvis" had been marked by the sacral promontory—this mark in one part of its course being actually on the apex of the parietal protuberance. Now, I am willing to admit that this may not be an imaginary case; but what is its significance if true to nature? Simply this, that the promontory which had marked that cranium *did not belong to a flat pelvis.* And that I am justified in making this assertion, a reference to page 479 of *German Clinical Lectures*[1] will prove; for, in an article there by Prof. Dohrn, of Marburg, on "Artificial Premature Labour with a Narrow Pelvis," we have the measurements of "a simply flat pelvis" given, in which the I.S. distance is *less*, and the I.C. distance *more* than in the normal pelvis,—evidently, therefore, neither a generally contracted pelvis nor a flat pelvis, whatever else it may have been. Here, then, we have the error Sir James Simpson committed in 1847 repeated by a distinguished German professor in recent years, and adopted in 1882 by one of the most distinguished of American obstetricians, and one who has laid special stress on this very subject.

Though I have not the support of Dohrn in my views as to the mechanism of labour in the flat pelvis, I am glad to find that our experience has brought us to the same conclusion, for I find him at page 483 saying, "If I appeal to my own" experience, "it speaks decidedly in favour of head presentations."

Charpentier[2] also accepts this illustration of Dohrn's as evidence of the necessity for the parietal boss being compressed by the sacral promontory in the *flat* pelvis.

Sir James Simpson's argument, therefore, amounts to this, that if the forceps is applied so as to bring the vertex first through the brim of the contracted pelvis, flexion will necessarily take place, and the biparietal and not the bitemporal (coronal) diameter will have to be squeezed through the narrow conjugate. We have just seen that if the head is in the oblique diameter of the pelvis, this is a *physical impossibility.* That theoretically it *may* happen when the head is in the transverse cannot be denied. If it did ever happen, I should say that Nature had taken the most awkward way to get out of her difficulty. That it *actually does not* happen the following cases will at least help to prove. See also, in support of my contention, Spiegelberg's[3] and, in part, Dohrn's views as quoted by Charpentier.

The first case I shall give in detail, though only the last portion of it bears on this point. The rest of it, however, will be referred to further on. I published this case in part in the *Glasgow Medical Journal.*

[1] New Sydenham Society, 1877.
[2] *Traité Pratique des Accouchements*, p. 180, vol. ii.
[3] *Ibid.*, p. 164, vol. ii.

Case I.—Mrs M'L.—*first* confinement, March 1874; in labour four days; presentation "cross" (meaning breech), and the child, a boy of medium size, still-born. *Second* confinement, August 1875; labour two days and one night; delivered with the forceps after half-an-hour's "hard work" on the part of the accoucheur, who declared that he had worked with "all his might." The child—a very large boy—was still-born. *Third* confinement, September 1876; nineteen hours in labour; delivered by the forceps of a living girl, "much smaller than the boys." This girl lived for one year. *Fourth* confinement,[1] 11th November 1878. My first attendance. Head occupied the brim. The anterior fontanelle was felt in front and to the left; the sagittal suture, lying just behind the pubis, ran obliquely backwards and to the right, the part first touched by the finger on examination being *behind* this suture. The position of the head was thus peculiar, being, in fact, the third cranial position, but with the right parietal bone presenting instead of the left, on account of the obliquity of the head in the pelvis. Simpson's forceps was applied in the usual manner, and with no material difficulty, the blades lying one on either side of the pelvis. Little advance was made, though as much force was employed as I felt justified in using; and after the forceps had been fifty minutes on the head, it was still substantially where it had been at the time they were first applied. I was now driven to the conclusion that the forceps were preventing what nature was desiring; and if I had had a pair of straight forceps at hand, I should have expected a good result with them. Feeling persuaded, however, that if only a sufficient amount of *vis a tergo* were present, nature would be able to complete the delivery, or at least to rotate the head, I removed the forceps; and then placing my left hand on the fundus of the uterus, and passing my right arm under the right thigh of the patient, I clasped the fundus uteri in both hands, disposing the ulnar edge of each as far over on the posterior surface of the fundus as possible. Fortunately I secured a good hold; then fixing my breast against the side of the bed in such a position as to enable me to pull in the axis of the pelvis, I drew on the uterine contents during the next pain with all the force I was capable of exerting, when, to my great satisfaction, I found that I had brought the head quite to the outlet. Less force sufficed to complete the delivery, the head passing out in the second position. I now discovered the cause of the lateral flexion of the head, for the right hand of the fœtus was found doubled up behind its right ear. The child—a very large boy—cried vigorously when born; and on examining the head for marks of the forceps, no injury could be found beyond a slight abrasion of the cuticle behind the left ear. The child did well; and with the exception of a mild attack of tonsillitis on the tenth day, the mother made an excellent

[1] *Glasgow Medical Journal*, 1879.

recovery. *Fifth* confinement, May 1882. Forceps applied to head not through brim. Head descended with a jerk, which I felt and heard. There was a considerable indentation on the left frontal bone—the upper and inner portion—between the frontal eminence and the anterior fontanelle; but the edge of the bone forming the fontanelle was not depressed. The forceps had caught the head over the right frontal eminence and over the left ear. The head said to be broader than the boy's. The child, a girl, lived. The measurements of the pelvis were now taken, and were as follows:—Interspinous, 9 inches; intercristal, $10\frac{3}{8}$ inches; diagonal conjugate, $4\frac{1}{4}$ inches.

I have this day (11th November 1885) seen these two children. They are a strikingly healthy and bright-looking pair. I found the mark on the girl's head quite distinct to the touch, as a spoon-shaped depression about $1\frac{1}{2}$ inch broad; but on account of a good crop of hair, the mark could not be seen.

See also Cases V. and X.

For the next case I am indebted to Dr G. of Glasgow.

Case II.—Mrs S.—*first* confinement, seven months' child; no assistance required; child born alive. *Second* confinement, twin miscarriage. *Third* confinement, midwife sent for Dr G. after many hours' severe labour. Head impacted at the brim. With Simpson's long forceps, after much trouble, delivered her of a dead male child of large size. Deep indentation over junction of frontal and parietal bones of one side. *Fourth* confinement, first cranial presentation; long forceps for delay at brim; head well ossified, and of moderate size; great force for over half an hour. Child born inanimate, but was resuscitated, and did very well, as did also the mother. Deep indentation (evidently a fracture) at junction of left frontal and parietal bones. *Fifth* confinement, delivered of a female child with long forceps; first cranial presentation; head indented on left frontal bone near junction with parietal; forehead slightly abraded from forceps. Mother and child did well. *Sixth* confinement, delivered by Dr G.'s assistant of a dead female child. Head marked as in the others. At the present date (November 1885) those indentations are perfectly visible. The children are healthy, strong, and intelligent.

Now, if we note what part of the head in these cases of delivery *with the forceps* is indented by the sacral promontory, we will find it to be the bitemporal always; and this region is at least $1\frac{1}{4}$ inch anterior to the parietal protuberances. We thus see further that this argument is fallacious.

Fifth,[1] "That the *duration* of the efforts and sufferings of the mother is greatly abridged by turning, when used as an alternative for craniotomy and the long forceps, and that thereby her chances

[1] *Loc. cit.*, p. 409.

of recovery and safety are increased, whilst the infantile mortality is decreased, because this operation can be performed earlier in labour, and more speedily than the application of the long forceps or craniotomy."

This is obviously an argument not against the forceps, but against *delay* in the use of the forceps, for this operation can be performed, if necessary, quite as early in labour as turning can. If a little more dilatation of the os is required for the introduction of the forceps, a very few minutes, with one of Barnes's bags, would suffice to accomplish this. The same remarks may be applied to the case of craniotomy, for this is rather an argument not against craniotomy, but against unwarrantable delay in the performance of the operation. But is danger to the mother and the infant decreased by the frequent practice of turning? Not necessarily so, even should it effect an abridgement of the labour. For although it is true that beyond a certain limit as to time, labour which has become what we call prolonged is dangerous to both mother and child, yet within this limited time which we without fear permit, because we look on it as normal, it is *not* true that a precipitate labour is safer than one of average length. Interference in the course of labour with the sole object of shortening its duration, if this had not already been, or was not threatening to become, prolonged, used to be called "meddlesome midwifery;" here, however, we have it called the avoidance of "dangerous delay." The fact that the labour can be terminated more speedily when version has been determined on than if the forceps were to be used "cuts both ways;" for whilst it is true that the time required is shorter, it is no less true that there is vastly greater need for hurry in the case of version than in the case of the forceps. For whereas five or six minutes may be taken as the maximum time the operation must last from the instant the funis has passed the os uteri, if the child is to be saved, the head can in the grasp of the forceps, as has been pointed out by Martin, be moulded for one hour at least without the slightest danger to the child. The relative effect of these operations on the mother I shall consider later on.

Sixth,[1] Another position taken up by Simpson in support of his contentions, and on which he dwells very fully and with no little satisfaction, is that numerous cases have occurred in which a woman has been delivered of dead, or nearly dead children by forceps, and in previous or subsequent labours of living and sometimes vigorous children by version, or when the breech had been originally the presenting part.

Now this would be a very powerful argument if exactly the reverse did not frequently happen. I am not aware that many instances of this have been recorded; but I have

[1] *Loc. cit.*, p. 397.

met with many myself, and I have no doubt that many unrecorded cases have happened in the practice of others. As I consider it important to demolish this argument, I select a few of these cases from my notes, remarking beforehand that Case I., that of Mrs M'L., is a case in point. Further, had I, in this case, turned at the fourth confinement after failure with the forceps, turning would have got the credit for the "very large boy," who "cried vigorously when born."

Case III.—Mrs M'D.—*first* labour, breech presentation; difficulty with the head; child still-born. *Second* labour severe; head, which had been the presenting part, was greatly elongated; child alive. *Third* labour, cranial presentation; head caught at brim; os half dilated; Simpson's forceps applied at 5.30 o'clock; lock quite within the vulva; handles wide apart, and lock tight and incomplete; traction brought down head slightly with a "click," but no further progress was made. Head found to be now in third position; forceps, which had been withdrawn, were again applied, and this time as nearly as possible in the left oblique diameter of the pelvis. The instrument now locked well, and the handles were much closer. The child was born about 6 o'clock, the head passing out in the second position after slight rotation of the forceps. Respiration was very difficult to establish, and the child could not be washed for about thirty minutes. It cried very much for two days, but eventually did well. There was a mark of the forceps on the middle of the back of the neck, and extending down to the level of the shoulders. There was also a mark on the upper part of the forehead, where there was a superficial cut of half an inch in length. The child was said to be the same size as the first.

These three labours were all attended by myself.

Case IV.—Mrs P. had ten children in all. The first nine were born alive; the first two (large boys) with forceps; the sixth, the largest boy of all, said to have weighed 12 pounds, without forceps, and without difficulty in the establishing of respiration. The tenth child was a "plump" girl; the breech presented; the doctor had "a desperate fight;" the child was still-born. The same doctor had been with Mrs P. in all her confinements, and she told me that he informed her he would have had no difficulty if the head had presented. Mrs P.'s health has been worse since this labour, and there has been considerable uterine trouble.

The next case came under my notice through the request of Dr R. of Glasgow, that I should see her with him, in order that we might decide as to the induction of premature labour. It was a case of generally contracted pelvis, the true conjugate measuring about $3\frac{1}{2}$ inches.

Case V.—Mrs C.—*first labour*, forceps required; a large girl; head much moulded and marked by forceps; still-born. *Second labour*, forceps; small male head, marked and cut; child born alive. *Third labour*, a small male child; no aid whatever; child alive. *Fourth labour*, lingered for many hours, when midwife sent for Dr Ritchie, who delivered the patient by forceps of a dead child. There was a spoon-shaped depression over the vertex, near the anterior fontanelle, caused by the sacral projection. *Fifth labour*—the one about which I was asked to advise—was induced at eight months; child was born without assistance; it lived three days. *Sixth labour*, full period; cranial presentation; male child, alive; second stage did not occupy more than two hours; the child, which was of fairly average size (perhaps somewhat less in size than the fourth child), was expelled *by uterine effort alone.*

In this case it is evident that if the breech had presented in the last labour, it would naturally have been looked on as a case in proof of the advantage of version.

The notes of the following cases have also been put in my possession by Dr G., and I append his own remarks on the case:—

Case VI.—Mrs J.—*first labour*, instrumental delivery; child still-born. *Second labour*, child born alive; delivered by forceps. *Third labour*, first cranial presentation; Simpson's long forceps; tight pull; male child, fair average size; child all right. *Fourth labour*, first cranial presentation; Simpson's long forceps; not so difficult as last; female child, smaller than the average; child all right. *Fifth labour* (5th May 1881), hand presentation easily converted into breech by introduction of hand, and bringing down both feet; no particular difficulty with body; delivery of head extremely difficult; tried at first manual traction; failed; attempted to apply forceps, but the fit was so tight that the blades could not be introduced alongside of head; then used much stronger manual traction, and, after a severe pull, managed to complete delivery, the head having been born about ten minutes after the body; child inanimate, and remained so for about ten or fifteen minutes (heart beating all the time), when it gave a first inspiration. Child did well, though head swelled somewhat afterwards. It was probably less in size than the third or fourth. The children's heads were all extra well ossified, and in spite of strong and regular pains, remained above the brim. The conjugate diameter is lessened by at least half an inch.

"Would, in view of above experience, prefer much to use Simpson's long forceps for delivery than turn, since in the last case the child was very nearly sacrificed."

In the next case both the labours occurred in the Hospital.

Case VII.—Mrs L. This woman was admitted into the Kennedy Street Temporary Hospital in 1879. She was at full time; the head presented; the late Dr Lyon's axis-traction forceps was applied, and after very great difficulty a large child was born, dead. The woman made a good recovery. She was advised to have labour induced should she again become pregnant. On 20th May 1881, she was admitted into the new Hospital for this purpose, being then, as was supposed, about 7¾ months advanced in pregnancy. She is a rickety patient, and the true conjugate diameter is estimated to measure 2¾ inches. Barnes's bags were used, the largest one having been expanded so as to have a circumference of about 9 inches. The feet were found to be presenting. Twenty minutes after the rupture of the membranes, the body had entirely passed the brim, but not without a considerable amount of force being employed. The cord was found to pass between the child's thighs, and was three times round the neck. This having been undone, so far as possible, and the arms dislodged, traction was again employed in the axis of the inlet. Moderate pressure from above was also employed. Five minutes were thus spent in almost uninterrupted traction without much sign of advance on the part of the head. Free pendulum movement was then employed for one minute, when extraction was effected. Slow irregular contractions of the child's heart were observed for a short time after birth, but none of the usual methods of artificial respiration employed induced it to breathe. Child weighed 4 pounds 6 ounces. Biparietal diameter was 3⅜ inches, but it could be compressed to 3 inches, the bitemporal was 3⅛, and the bimastoid 2⅞. The circumferences of the child were taken, and found to be as follows:—

Ant. post. of head,	12¼ inches.	Breech, .	10¾ inches.
Sub. occip. bregm.,	11¾ „	Shoulders, .	9 „
Pelvis, . .	8¼ „		

There was a moderate amount of hæmorrhage from the cervix. Patient was weak for the first 30 hours, the pulse having risen, after the bleeding had had time to tell on it, to about 180. A vaginal injection of hot water stopped the hæmorrhage. The patient made an excellent recovery. Cervix found slightly split on right side. Considerable amount of swelling and tenderness over the upper part of the vagina, round the cervix, so that free examination could not be made.

I confess that the results of these two labours impressed me very strongly; the fact of a large child having been extracted, although dead, with no damage to the mother, made me feel assured that had the second soft and immature head presented at the brim, I should have had, with the forceps, no difficulty in

extracting it without risk to the infant, and, I *now* think, without the slightest laceration of the cervix.

Case VIII.—Mary R., admitted to Maternity Hospital 5th December 1881, in pregnancy for the second time. The first labour the head had presented, and the child is said to have cried after having been "slapped." In the present labour, the feet presented, the upper part of the body was caught at the brim, the shoulders being out of reach of the finger. I passed my hand up gently, and drew down the shoulders, but this caused a very severe laceration of the perineum, which gave way like rotten cloth. The head was now retained in the pelvis, and had to be delivered by the forceps, which were in readiness. Seven minutes elapsed between the birth of the body and the extraction of the head. The child was with difficulty brought round. The mother said it was the same size as the first child born seven years ago. The weight of the present child was 8 pounds.

The next case was seen by me in the country about two years ago. I found the child's neck had parted during traction, and that the head was still in the uterus. I applied Simpson's long forceps, using powerful compression, and delivered the head in about ten minutes. I give verbatim the letter from Dr W., who was called in as a consultant before I was summoned.

Case IX.—"Mrs W. has had six children in all, four previous to that you were called in to complete the delivery of, and one since. Her *first* labour was a very severe one; four doctors in attendance and forceps used; child still-born; made a good recovery. In her *second* confinement the head presented; she was attended by a woman, had a tedious labour, which ended well with a living child of ordinary size. Her *third* and *fourth* children were delivered by forceps and were both still-born. Her *fifth* confinement was that in which you had a part. The presentation was *natural*, labour severe and tedious. Dr M., after trying the long forceps without avail, turned and brought down the feet. The head refused to follow, and I was then sent for in consultation. Attempts to extricate by traction were persisted in with melancholy result you know. The woman made a wonderfully favourable recovery! In her last (*sixth*) confinement, the head presenting, she was attended again by a woman, and was delivered of a living child. Her labour in this case came on a fortnight or so before she expected it." There is no very marked deformity of pelvis, only a "slight projection of sacral promontory, narrowing the inlet somewhat antero-posteriorly."

The following is a case of indentation of the head after an unaided delivery, showing how easily such a depression can be made in a slightly premature child. The flattening of the vault

probably arises from the fact that there was not time for moulding on account of the early yielding of the frontal bone:—

Case X.—Mrs L., admitted into the Maternity Hospital 2nd May 1884. She has had two previous labours, which were difficult, the children having been delivered at the full time with forceps. Her last menstrual period was the latter end of August. Patient is small and rickety. The prominence of the sacrum is within easy reach of the finger, and the outlet roomy. The membranes are unruptured; the head lies above the brim but engaging, evidently caught on the sacral promontory. About 1 P.M. the head has been forced more deeply into the inlet, but was still caught on the promontory. About 1.30 the membranes ruptured spontaneously; the child was born naturally, the pains coming on forcibly. The child weighed $6\frac{3}{4}$ lbs., was a male, alive, and $8\frac{1}{2}$ months. The child's head is showing signs of regaining its natural shape. It was much lengthened and flattened on the vertex at birth, with a considerable depression of the right frontal bone. Patient was dismissed on the 12th, both doing well. About the end of August Mrs L. brought the child to show it; it was suffering from a recent attack of bronchitis, and looked a little pale, but was otherwise strong and healthy. The child is large and well nourished. There is still a marked depression in the right frontal bone, but the flattening of the vault has mostly disappeared.

I have, in discussing this sixth argument of Simpson's, dwelt only on the relations of turning to the forceps, but his reason for preferring turning to craniotomy can be easily understood when we find him speaking of the latter operation in these terms:—"The operation is not one which is either morally or professionally justifiable, if the child be still living." It will be seen that the safety of the mother is here forgotten in the determination not to destroy the child, but give it time to die.

But there are other objections to the position taken up by Simpson and his followers, that, as a general rule, failing to effect delivery with the forceps, turning and not craniotomy should be resorted to: First, that it does not follow that turning will be speedier and safer than craniotomy, and that if craniotomy has after all to be performed, the woman is certainly, *as a rule*, in a worse case than if the child had been at once sacrificed. If the woman is seriously damaged by this attempt to save the child, we ought to feel but poor consolation from the reflection which Barnes seems to think sufficient, that we did our best for the child.

Again, as a further objection, let us bear in mind that in normal pelves the risk of laceration to the cervix and vagina from turning is very much less than from the same operation in contracted pelves, and I am not aware that this has been dwelt on as germane to the discussion, if it has even been at all noted by writers on the subject.

The reason for the increase of this danger in contracted pelves lies in the fact, that whereas in turning with a normal pelvis nearly the whole of the time spent in extracting the head through the pelvis can be expended in dilating the cervix and vagina (though I fear that in actual practice this is too often forgotten even by the most careful of us, on account of the great importance of the bony canal in the mechanism of labour), on the other hand, every moment of the time at our disposal is required in the contracted brim to drag the head through it, and we are compelled, if the very object with which we undertook the operation is to be successfully carried out, to "hasten," not "slowly," but with all despatch, the transit of the head. That this has too often been attended with disaster to the maternal soft parts I am prepared to prove. Indeed, the case of Mrs L., in whom labour was induced, and who suffered to an alarming extent from hæmorrhage after labour, is a case in point. Another instance of this will be found reported in full (though for altogether a different reason) in the *Edinburgh Obstetrical Transactions,* vol. vi. This case happened in the Maternity Hospital, Glasgow, while I was on duty, and the woman was delivered by Dr Wm. Turner, then house-surgeon, and one of the most intelligent and careful of house-surgeons. The cord had prolapsed, the foot being the presenting part, and though Dr T. recognised the case as one of pelvic contraction, there was no evidence to satisfy him of contraction so severe as was subsequently found to be the case.

I give the case briefly, but as it is, I think, the only instance of a living child having been extracted through a pelvis with a true conjugate diameter virtually under 2¾ inches, it will repay a reference to the full report.

Case XI.—M. C., primipara, about 30 years of age and unmarried, was admitted 20th February 1881; was at full term; had crossed from Ireland to Glasgow with her avowed future husband, who had come to Scotland in search of employment. On landing she had been deserted by him, and had remained in a destitute condition until she found refuge in our hospital. The impression of her face was vacant, and she presented symptoms very much akin to those of dementia in a mild form. The presentation was footling, and the cord, which was prolapsed, could not be replaced. As soon as dilatation was sufficiently far advanced to permit of podalic extraction, this was effected, but the head was caught at the brim. Traction with compression externally, after the manner recommended by Goodell, was successful after four minutes, and the child, a girl weighing 6¾ lbs., was born alive. A straight tear, half an inch in depth, was found to have taken place in the left side of the cervix. The death of the woman, which occurred on the eighth day, was due to septicæmia. This I feel sure was largely due to the mental shock she had received, and the destitution

which preceded her admission to the hospital; but I think there can be little room for doubt that the lacerated cervix had a large share in the fatal result. At the *post-mortem* a tear was discovered in the right side of the cervix also. The pelvis in this case was transversely large, the interspinous and intercristal measurements having been respectively 10⅛ and 11 inches. Originally, therefore, that is before the flattening, a justo-major pelvis.

In referring to this case I do it, not to show that the cervix *may* be lacerated under these circumstances, but to emphasize the fact that, as happened in my own hands in the case of Mrs L., the desperate efforts which a conscientious man makes in such exciting circumstances to save the life of the infant make the accident a most natural result. But it may be said that if care is taken, and the os is sufficiently dilated to permit of turning, need this accident occur? Is it really the case that much if any additional expansion of the cervix is required, after danger to the child begins—that is, as soon as the umbilicus has cleared the cervical orifice? I say it is, and to an extent to which not sufficient weight is given in books on midwifery, whilst, indeed, the subject is ignored as if of no consequence in most works. Since my attention has been directed to this subject, I have noticed many similar instances of this accident, and as I consider it of very great importance in the settlement of this question as to version, you will excuse me going a little more into detail on this point. I have ascertained that the largest of Barnes's bags can be expanded by water till it reaches a circumference of 9½ inches before bursting. And here let me add that as the life of india-rubber is a short one, these bags are not safe for use if more than a very few years old.

Now, from measurements I have made, or have had made for me by careful observers, of children at or very soon after birth, I find the circumferences of the various parts of the child's body, with reference to its passage through the soft parts of the mother, to be as follows on an average of eleven cases:—

Pelvis, . .	10·18 inches.	Half-shoulder,	13· inches.
Half-Breech, .	11·54 „	Sub-occip.-ment.,	10·36 „
Breech, . .	13·75 „	Sub-occip.-front,	12·61 „
Thorax, . .	11·68 „	Sub-occip.-bregmat.,	12·18 „

These measurements I have seen no similar circumferences to compare with, except Dr Matthews Duncan's head girths. The last two of my list he gives as respectively 12·75 and 12·5, nearly the same relatively as mine, though greater absolutely. He finds the sub-occip.-vert. to be 1·5 less than the sub-occip.-front. What must strike one at a glance here is the fact that the breech is, on the average, the greatest of the circumferences. I suspect, however, that when we consider the extent to which the breech could be squeezed in its passage through the strong cervix, com-

pared to the less yielding structures of the head, we must make some allowance for this measurement, though I do not think it, if of the average size, could be so reduced more than an inch. This would bring it, when so compressed, to almost exactly that of the sub-occipito-frontal, which is still, I think it must be acknowledged, more than would have been believed. It is easy now to see how in a case of podalic version, and where five or six minutes only can, if the child is to be saved, be allowed to elapse from the time the os encircles the belly of the child, and thus compresses the funis, till the birth of the head, and how, if nearly the whole of this time is required for the mere transit of the head through the pelvic brim, almost no time is left for the expansion of the cervix from 10 inches—the girth of the child's pelvis—to 12½ inches, the greatest girth of the head. So, without having these measurements forcibly impressed on us, how can the soft parts be expected to escape? Let us bear in mind the fact, that it is just as the perinæum is sweeping over the sub-occipito-frontal region, that tears in this region occur or begin, and that, though we can see the process, and to a great extent control it, we cannot always prevent it. It will not then surprise us that so sudden a transition, viz., from the pelvic girth to that of the sub-occipito-frontal, should do serious damage to the cervix, since less rapid transition, viz., from the sub-occipital-vertical to the sub-occipito-frontal, makes so much difference in the case of the perinæum. But it may be said that in normal cranial presentations this laceration of the cervix may take place also, and, indeed, is known to take place, to some extent at least, in almost all cases of normal first labours. True, but with what admirable mechanism is the cervix dilated in cranial presentations, when we think of the steady and alternate expansion and relaxation of the os during the first stage, fortunately a stage that, as a rule, is not interfered with by "meddlesome midwifery." I have seen in cases of head last labour, that the cervix was so tightly embracing the shoulders that the cause of the difficulty in bringing them down was not the bony contraction at the brim, but the tight and undilated cervix.[1]

[1] The following case has come into the Hospital since this paper was read, and, as it is an illustration of what I am desirous of emphasizing, I give a brief report of the case here, supplied to me by my house-surgeon, Dr John Brownlie. Patient admitted 13th Nov. 1885, at 5.20 A.M.; unmarried, secundipara. Her first confinement took place about eleven years ago; the labour was normal; presentation cranial; child full time, alive, and of good size. The membranes at this, the second labour, had ruptured five days before admission into the Hospital, and pains came on, but passed off again. They returned on the day of admission. On coming into the Hospital, the right hand was found presenting low down at the vulva, and the head was lying in the left iliac fossa. The uterus was quiescent. The os was dilated to about the size of a crown piece. Chloroform was administered, and Dr Sloan performed podalic version, bringing down the right foot. Labour was then allowed to proceed. Dr Sloan, finding that the margins of the os were thin

This may be a fitting opportunity for noting that Simpson, in arguing in favour of turning, does indeed refer to the danger of laceration of the uterus, in order to prove that this injury is "*somewhat less likely*" to arise from turning than from forceps or craniotomy, but a perusal of his argument will show that he thinks only of *protracted bruising* as a cause of laceration, and does not suspect that version, by causing, as I have shown, a too rapid expansion of the cervix, may cause laceration of that part of the uterus. He does speak of version as to be performed after the dilatation or dilatability of the passage will allow, but this is not referred to as a caution on account of danger from the operation, but as indicating how soon version may be attempted. Nor is it only a laceration of the cervix that may result from version in contracted pelves, for Dr Radford[1] mentions a case where, although it is stated that the os had become softened, the tear had evidently begun at the os during the process of extraction, and had extended afterwards through the cervix and part of the body of the uterus. But I can appeal, in further proof of the danger of laceration of the cervix from rapid dilatation, to Emmet, the great American gynæcologist,[2] for, without any special reference to version, but only referring to rapid labours in general, he says, "I cannot divest myself of the conviction that rapid labour will be found, on further observation, to be a far more important factor in causing this lesion than has been indicated by this record."

Perhaps it will be profitable at this stage of our inquiry to ask you to consider with me to what my remarks, so far as they have gone, have led up. What now are we to think of Sir James

and hard, gave special injunctions that the head was not to be drawn rapidly through the cervix. Soon after patient recovered consciousness, the uterus began to contract, and the leg and breech descended. The left leg remained extended over the abdomen of the child. The body was drawn forward, and the leg released. The arms and shoulders were then drawn down, some difficulty being experienced in the case of the right arm. As the cord had by this time become pulseless, the head was delivered as speedily as possible. It did not, however, come easily, and the difficulty appeared to be at the cervix. Pressure on the occiput, the child being drawn forward over the abdomen of mother, finally brought the head down. It then passed through the cavity with great ease. About five minutes were occupied in the passage of the head. Although the heart was beating, artificial respiration failed to restore animation to the child, which was a small one. The interspinous measurement is $9\frac{3}{4}$, the intercristal $10\frac{3}{4}$. Patient made an uninterrupted recovery, the only rise of temperature of any consequence being on the day of her admission. She was so well as to be discharged (at her own request) on the eighth day. On vaginal examination it was found that there was absolutely no irregularity round the os. In the posterior wall of the cervical cavity there is a little elevation of surface resembling a small tubercle. There is no cicatrix, nor any appearance of a tear.

[1] *Cases of Laceration of the Uterus*, p. 17.

[2] *The Principles and Practice of Gynæcology*, p. 450.

Simpson's arguments in favour of version? What, if any, portion of them are we to accept? what are we to consider as doubtful, and what are we to reject as erroneous? And having settled this, what, further, is to be our practice in the future, in cases of delayed labour arising from obstruction at the conjugate of the pelvic brim?

We have seen that Simpson's propositions may be reduced to six, these embodying the substance of his conclusions in favour of version as an alternative for craniotomy and the long forceps. I shall tabulate them as queries, and give a brief reply to each, and then ask you to decide between us.

First, Is the fœtal cranium of a conical form, enlarging from below upwards, the vertex being the basis of this cone?

This is true *to so slight an extent* as to make it *almost a distortion of the truth.*

Second, Does the hold which we have of the protruded body of the child, after its extremities and trunk are born, give us the power of applying so much extractive force and traction at the engaged fœtal head as to make it become compressed to a greater degree than would the forceps if the vertex presented?

Yes, by fixing the head in the brim, and thus being compelled to pull the head in the axis of the brim.

Third, Is the lateral and temporary compression of the fœtal head "by the contracted sides of the pelvis," as after version, less dangerous to the life of the child than its oblique or antero-posterior compression with the forceps?

This is very doubtful, and at anyrate has, if true, never been proved.

Fourth, In the flat pelvis, in head-first cases, is the head necessarily flexed, so as to bring the biparietal diameter into the true conjugate of the brim, instead of, as after version, to one side of it?

No; in the strictly flat or the generally contracted pelvis, never.

Fifth, Is the duration of labour shortened by version as compared to forceps, and are the chances of the mother and child thereby increased?

The labour is shortened, but the chances of the mother and child are often thereby *decreased.*

Sixth, Have women frequently been delivered of living children by version or breech presentations, who at previous or subsequent labours were delivered of dead children by forceps?

Yes, and women have frequently been delivered of living children by forceps, or in unaided labours, who at previous or subsequent labours were delivered of dead children when the breech presented.

This much is granted, then, that a head coming base first may pass through a contracted brim in less time than one coming vertex

first, and that, when so extracted, the child may be alive. If, therefore, this operation can be performed with little or no risk to the mother, it follows that turning will, under circumstances unfavourable to the forceps, be sometimes a permissible operation. The degree of contraction of the conjugate, which will make version under any circumstances justifiable, it is important to determine; but instead of arguing the question on theoretical grounds, it will be better to speak from experience. Case XI. shows that this is *possible* with a conjugate of $2\frac{3}{4}$ ins.; and I myself have extracted a child weighing 7 lbs. through a conjugate of $2\frac{1}{2}$ ins. The child gasped but did not survive. I regret that I am able to state exactly the size of the conjugate, for the woman died from peritonitis, and careful measurements of the pelvis were made at the post-mortem. In these two cases, Dr Turner's and my own, the pelves were very roomy transversely. Could forceps bring a child of average size through such a conjugate? I am unable to say; but a reference to Case VII. will show what axis-traction forceps have done. Though this child was still-born, it is not to be forgotten that it was a large child, and that the conjugate in all probability measured only $2\frac{3}{4}$ ins.,—so small, indeed, as to prevent a premature child, weighing 4 lbs. 6 oz., from being born alive, when presenting as a footling. A common objection to the forceps in these cases of *flat* pelvis, for it is here mainly that forceps are apt to be laid aside for version, is that, in the words of Dr A. R. Simpson, "such a grasp of the head," viz., in its antero-posterior diameter, "would produce, on the one hand, a dangerous compression of the child; and on the other, would at once lessen the size of the fœtal head in the roomy transverse diameter of the pelvis, and tend to make it bulge in the direction of the contracted conjugate."[1]

Now, not only do the forceps grasp the head in its oblique diameter, *as a rule*, and thus actually assist the lateral compression instead of hindering it, but compression is *hardly at all necessary* if the forceps is skilfully handled. The fact that the child is born at all, under these circumstances, proves that the head was not really bulged in the direction of the contracted conjugate, or its birth would have been prevented, or at least hindered, instead of, as several of my cases reported here prove, really accelerated —women having had living children by forceps and dead children by presentation of the breech. See especially Case III., that of Mrs M'D., where the grasp of the head was actually antero-posterior. The application of straight forceps to the transverse diameter of the head, *and in the lateral conjugate of the brim*, would be theoretically preferable to the oblique grasp; but I am not aware that any instrument has been devised which could do this.

But, in my opinion, the chief reason for version being by some preferred to forceps is, that in extracting the head after version the operator has no difficulty in pulling in the proper axis, for the

[1] *Contributions to Obstetrics and Gynæcology*, p. 170.

head adapts itself to the best advantage at the brim when base first, whereas considerable skill is necessary to manipulate the vertex at a contracted brim when in the grasp of the forceps. Since the introduction of the axis-traction forceps, an instance is mentioned by Dr Simpson in which axis-traction forceps succeeded in delivering a case of *justo-minor* pelvis in which at a previous labour the child had been turned and perforation required afterwards. I do not mention axis-traction forceps because I think them absolutely necessary. What I insist on is, that the traction should be axis-traction. Now, in my experience axis-traction can be performed by the ordinary forceps in the hands of a skilful man, whilst in the hands of an unskilful practitioner axis-traction forceps are likely (I speak from observation) to be used for non-axis-traction.

But given a case where the forceps has been used and fairly tried for one hour, without being able to engage the head in the brim, are we now to turn or perforate? This is the point of greatest difficulty to determine. In my experience it has been too much in the past a routine practice to decide that because the forceps has failed the child must therefore be turned; and I believe that this is often the practice even although the child is believed to be dead, under the impression that version is a safer operation to the mother than craniotomy. Now, let us consider what we have to settle before determining as to whether in such cases we should turn or perforate. First, as to the child. By the former operation the child has a chance of life; by the latter operation the child is sacrificed. Therefore, were we to consider the matter only from the point of view of the safety of the child, we should in all such cases, if the child be alive, turn. But what about the mother? It may be taken for granted that craniotomy *in such a degree of contraction of the pelvis as we are at present considering* is attended with little danger to the mother, especially if the pelvis be shallow.

What is the amount of danger in turning?

Dr Barnes, in his recent excellent work, mentions that it would be dangerous under such circumstances to turn if the uterus be firmly contracted round the child, "balling it;" or if the head is impacted or very firmly set in the brim of the pelvis; or if there is marked exhaustion or prostration of the mother. Few careful men would venture to turn under such circumstances. But take a case where there is not *very firm* compression of the child by the uterus, and not *much* exhaustion of the mother. Are we now justified in turning? We have seen that turning will give the child a chance. We know that under these circumstances turning will add some risk to the mother; and if turning results in a dead child, and craniotomy has to be performed afterwards, we know that the danger to the mother has been materially increased by the attempt to save the child. I have seen several such cases, and the lessons to be learnt from them are so valuable that I insert here three of them.

Case XII.—Mrs M'G. This woman was admitted into the Maternity Hospital on 15th September 1880. Her first three children, girls, were born naturally; the next three, two boys and one girl, were delivered with forceps; the seventh, a boy, after failure with the forceps, was delivered by turning; and the eighth, a girl, was delivered by Dr Black with long forceps. All these children were born alive. The patient has made good recoveries from all her confinements except the seventh, her recovery from which was tedious. Patient was now in labour with her ninth child. Before admission to the Hospital the late Dr S. and Dr G. had tried the forceps, and, failing, had unsuccessfully attempted to turn. The woman was then brought into the Hospital, and was in a very weak state. It was deemed by those of the staff present, since there was a possibility of the child being alive, that we should try the forceps again; but that should they fail, perforation should be had recourse to. On the arrival, however, of Dr J. G. Wilson, who was consulting physician, and no mean obstetric authority, he recommended, seeing that the woman had rallied somewhat, that turning should be attempted if the forceps failed. This was done, and with great difficulty succeeded, the aftercoming head having to be extracted by the forceps. The child was still-born, and had the appearance of having been several days dead. The woman died, and from the state in which she came into the Hospital, I could not but feel that it would have been better to perforate at once than have made any attempt to save the child, which, though this was doubtful at the time, had been really dead. The pelvis was found to be only slightly contracted, but the child weighed $9\frac{3}{4}$ lbs.

Case XIII. (reported by Dr Oliphant, house-surgeon).—Mrs G., admitted into Hospital 15th March 1884, in her third labour. Her first and second labours were forceps cases, and the children were still-born. In the present labour forceps had been tried, and, failing to deliver, turning was unsuccessfully attempted. The woman was then sent to the Maternity. When admitted her pulse was 150. She was very weak, and complained of great pain and tenderness over the upper part of the abdominal swelling. An examination of the abdomen gave the impression that the breech had escaped through a rupture of the uterus. The woman seemed to be sinking rapidly. Dr Sloan arrived, and decided to deliver her at once. Strong beef-tea was given, and a hypodermic injection of ether. Chloroform was administered, and perforation easily and rapidly performed. Barnes's long forceps and the blunt hook were applied, and the child extracted, the whole operation taking about ten minutes. The patient lived about one hour after delivery. At the post-mortem there was found to be a laceration of the vagina in Douglas's pouch. The conjugate diameter of the pelvis was 3 inches, and the transverse $4\frac{1}{2}$ inches. The child weighed fully $6\frac{1}{4}$ lbs.

The next case occurred in a neighbouring county town. I was sent for to perform craniotomy. Though it was evident the woman could not recover, the doctor in charge—one of the most careful and skilful of country practitioners—was naturally anxious she should not die undelivered.

Case XIV.—This woman had nine children, forceps having been required for the first one only. There was a narrowing of the conjugate diameter. At this labour the forceps had been tried by three medical men, and turning was then attempted. This could be only partially carried out, and when I arrived I found the head at the brim and the two legs in the vagina. With considerable difficulty I pushed up the legs sufficiently to reach the head, and perforated it; but found that even then it was impossible, on account of the legs being in the way, to extract the head. Turning was again attempted as the only way to deliver, and this was now an easy matter. The woman died, as was expected.

Now, what are our relative duties to mother and child under such circumstances? Are we justified in exposing the mother to serious risk in order to attempt to save the child's life? Barnes says we have done our best. Ought this to satisfy us?

Smellie[1] says, "We ought never to endanger the life of the mother to save the child." M'Lintock, the editor of Smellie's Works, adds,[2] "We are justified in endangering the life of the mother, if by so doing we can give to the fœtus a greatly increased chance." Napoleon, when the question was put to him, is said to have replied, "Save the mother, it is her right."

At a consultation at the Maternity here, the question of version or craniotomy was under consideration. One of the gentlemen stated the case for version thus:—

"The child is pure, innocent, and untried. The mother is rickety, has had her day, and has made a bad use of it, therefore let the child have its chance." *This doctor was an unmarried man.*

Is it not the case that we have contracted with the mother to deliver her out of her present difficulty. She has placed her life in our hands. Is it fair to risk it without her consent, even with the certainty of saving the child—especially if, as in the kind of pelvis we are considering, at a future pregnancy induction of premature labour would be probably safe to both mother and child. Though we may conclude, however, that we have no right to risk the life of the mother, yet if we feel that the operation we decide on will only risk her future health, we may be justified in attempting to save the child. In cases of doubt, I would advise that a gentle attempt at turning should be made, but that if we encounter any difficulty in the operation, perforation should be at once resorted to.

[1] Smellie's *Midwifery*, by M'Lintock, p. 334, vol. ii. (see also p. 131, vol. iii.)
[2] *Ibid.*, p. 335, vol. ii.

I now add a series of propositions for guidance in cases of labour obstructed at the pelvic brim. I do not offer them as final, but hope they may have a share in helping us to reach the time when the mist surrounding this important subject shall have vanished, and we shall be able to do more than we now can for the safety of both mother and infant.

In concluding, let me remind you that I have not attempted in this paper to give you a dissertation on this subject, but only a contribution to it. The present uncertainty as to treatment in cases of contracted pelvis will, I hope, be considered a sufficient excuse for venturing to do even this.

I. That MERE *disproportion between the child's head and the brim of the pelvis* is NEVER a sufficient reason for preferring version to the forceps as an original choice in the combined interests of mother and child.

II. That cases sometimes occur in which, *for other reasons*, version is to be preferred to the forceps as an original choice, but that if the child be of presumably average size, this operation should not be attempted with a conjugate diameter under $2\frac{3}{4}$ inches, and, with such a diameter, only if it is a *justo-major* pelvis flattened.

III. That the following are some of the "other reasons" for preferring version to the forceps as an original choice:—The occiput to the wrong side of an irregularly contracted pelvis; occipito-posterior position in a generally contracted pelvis, if this position cannot be rectified manually (or rather bimanually); prolapse of the funis; placenta prævia; face presentation; displacement or increase in bulk of the presenting part as by the partial or complete descent of a hand or foot along with the head; great inclination of the pelvic brim throwing the head on to the pubes instead of permitting it to be over the brim; *great* difficulty in applying the forceps, or a very tight and incomplete locking of the forceps after some difficulty in their application.

IV. That where the forceps for "other reasons" is unsuitable as an original choice, version may be tried, *not simply in the flat, but in the generally contracted pelvis also*, flexion of the head being no contra-indication.

V. That if version is decided on, the breech of the child, where this is at all practicable, should be allowed naturally to dilate the cervix; and that, if one leg must be brought down, the other should be left to increase, with the pelvis of the child, the expansion of the cervix.

VI. That if version is decided on as an original operation, it ought, if possible, to be done by the bipolar method, and as soon as the os is sufficiently dilated to permit of it—the membranes being, if practicable, kept entire after version, but ruptured at once, if this is necessary in order to keep the breech in its new position.

VII. That in cases of doubt forceps should be preferred to version as an original choice. But should the pelvis be shallow, version has this advantage, that if the body be born, the child can sometimes be made to breathe though the head is at the brim. Craniotomy will also then be less difficult to perform, should this operation be afterwards required.

VIII. That in cases in which the forceps has failed there should be some reason for suspecting other causes than disproportion (see Prop. III.) before version is attempted as an alternative to craniotomy.

IX. That the employment of version as an alternative to craniotomy, as a routine practice, is terribly hazardous to the mother, although it probably sometimes saves the child's life.

X. That in a generally contracted flat pelvis, if the child be of average size, and the degree of contraction be at all great, version is entirely inapplicable. A *short* trial should be made with the forceps. If no progress be made, craniotomy should be performed at once.

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