

# OBSTETRICS

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## Original Articles.

### EXTERNAL CEPHALOMETRY APPLIED TO ARTIFICIALLY INDUCED LABOR.\*

By Dr. M. PERRET.

**S**INCE artificial premature delivery within the limits indicated by Budin and Bar is able to render signal services in a great number of cases of narrowing of the pelvis, all the efforts of the accoucheur should tend to determine with the greatest possible exactitude the epoch at which one should bring about labor; the latest possible moment as far as the child is concerned, but at the same time early enough for delivery to occur without too many obstacles.

Among all the factors which come into play at the moment of labor, one of the most important is, certainly the volume of the fetal head, and in particular the extent of the bi-parietal diameter; for it is this or a neighboring diameter intermediate between it and the bi-temporal, which is placed at the superior strait of the excavation, following the antero-posterior diameter of the pelvis; that is to say following the smallest diameter of that strait.

Another feature about this diameter, which is of practical significance is the fact that it is reduced less than any other by the uterine contractions, its reduction not exceeding five millimeters.

As direct mensuration of this diameter is impossible, it is necessary to determine its extent by some indirect method.

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Ahlfeld, in 1871, was the first to attempt to solve this problem. He sought to ascertain the length of the fetus, and to deduce therefrom the extent of the corresponding bi-parietal and bi-temporal diameters.

He discovered that the distance between the coccyx and the vertex of the fetal head is almost half the total length of the body, and this distance, in multiparæ is equal to the distance which separates the superior pole of the fetus (as determined by palpation and ballottement), from the superior border of the symphysis pubes.

In primiparæ, by reason of the engagement of the head, he measured the distance directly by the aid of a compass, the extremity of one branch being placed, through the vagina, upon the fetal head, while the other branch was in relation by its extremity with the superior extremity of the fetus (recognized in the manner already stated).

This method, subjected to many sources of error, proved unsuccessful, and was abandoned, even by its author.

Dubois deduced the extent of the bi-parietal diameter by the duration of pregnancy.

Thus he found that the following relationship existed between the month of gestation and the bi-parietal diameter.

Seven months.....	7	cm.
Eight " .....	8	"
Eight and one-half months.....	8.5	"
Term.....	9	"

But we know how difficult it is to determine precisely the debut of pregnancy, the date of the last menstruation being often uncertain. Even when this is recognized, we cannot be sure of the date of the fecundating coitus. Dubois's method then is entirely insufficient, and too often inexact.

The procedure of Gönner, and that of Bruyère, which sought to determine the weight of the fetus by measurement of the feet, could naturally be of use only in case those members had already been extracted during labor.

On April 14, 1875, Matthews Duncan expressed himself as follows, before the Obstetrical Society of Edinburgh:

"Intrauterine craniometry, or mensuration of the dimensions of the fetal head before birth, is certainly destined to be of great importance, by reason of the great value of the

information which it can give the physician in the management of difficult labors, whether these be due to malformation of the pelvis (or other form of narrowing of the genital canal), or to augmentation of the volume of the head."

A number of years have now elapsed since I called the attention of the medical profession to the remarkable negligence in regard to intrauterine craniometry, in view of the fact that pelvimetry, which possesses so many points of similarity with it, has long been the object of numerous researches and experiments which have been of the highest practical value.

It would be superfluous to show what would be the clinical importance of the intrauterine craniometry, so I forbear to dwell upon this point. It would be the natural complement of pelvimetry, a complement now actually non-existent. Each of these arts, in a given case, would enhance the importance of the other. Intrauterine craniometry is the more completely missed, because the best work done in pelvimetry is imperfect, and this imperfection is clearly indicated by the apophthegm of Dubois and Crédé, who advise delay, especially in first labors, even if the pelvis is considerably contracted, in order to see if the natural forces will be sufficient for expulsion. The utility of this advice is demonstrated by the cases of spontaneous labor, at the hands of experienced practitioners, after everything had been made ready for the Cæsarean operation, as an indication of necessity.

In 1894 I suggested a new method, which would enable the obstetrician to measure directly the occipito-frontal diameter of the fetal head, and to deduce therefrom the extent of the bi-parietal diameter.

This method is based upon a certain number of researches which I briefly recapitulate here:

Having measured 120 fetal heads, with a bi-parietal diameter ranging between 83 and 87 mm., an average of 85.3 mm., I found that the average of the corresponding occipito-frontal diameters was 110.2 mm., a difference of 24.9 mm.

Of 97 fetal heads, having a bi-parietal diameter varying between 79 and 82 mm., average 80.4 mm., the occipito-frontal diameters corresponding were an average of 105.7 mm., a difference of 25.2 mm.

In 64 other cases, the bi-parietal diameter varying between 75 and 77 mm., the difference between the occipito-frontal and bi-parietal diameter was an average of 25.7 mm.

Finally in 47 other cases the bi-parietal diameter varied between 68 and 71 mm. (average 70 mm.) The difference between the two diameters was 23.2 mm.

We therefore concluded that, given a bi-parietal diameter varying from 70 to 85 mm., the extent of the occipito-frontal diameter corresponding would be an average of 25 mm. longer, and *vice versa*.

We are aware that at term this difference between the two diameters is admittedly 25 mm. average.

If then we are able to determine the occipito-frontal diameter, we have only to subtract 25 mm. to obtain the bi-parietal diameter.

The object of our procedure in craniometry is to determine the occipito-frontal diameter, and this is done as follows:

The woman is placed upon her back, and the operator applies his hands to each side of the belly, just as he does when seeking to determine whether or not the head is engaged. If it should happen that this engagement has occurred, there is no use in going further, since labor may set in. If the head is not engaged, the woman is placed transversely, clothing and bedding are rolled up and laid on the anterior surface of the thighs, where they serve as a cushion which supports the graduated arc of Budin's cephalometer, which is to be forthwith employed.

The ends of the branches of this instrument are grasped near the terminal buttons in such a manner that the latter is held between the middle and ring fingers by the tip of the last phalanx of each of the fingers. One should then begin the palpation of the head.

While we palpate with the finger-tips, we apply at the same time the buttons of the cephalometer, so that one is in relation with the forehead, and the other with the occiput. When the instrument is *in situ*, we read off the figure on the graduated arc, which indicates the distance between the buttons. From the gross measurement, we subtract the thickness of the abdominal wall, which we obtain by pinching up a fold of the latter, and measuring its thickness directly. The net amount represents the occipito frontal diameter. If now we

remember that a fetus at term has a bi-parietal diameter 25 mm. less than the occipito-frontal, we further subtract this figure, and thus arrive at the bi-parietal.

In March, 1898, I presented before the Paris Obstetrical Society a cephalometer intended for the above-described measurements, and which I believe may be readily applied. It is illustrated in the accompanying cut.

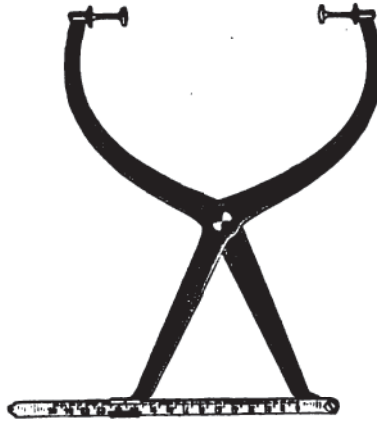


FIG. XI.

This instrument is a compass, the branches of which are curved like those of an ordinary spherical compass, but it has two peculiarities:

1. At the extremity of each branch is a flattened blade, so shaped as to be readily held between two fingers. These little blades revolve on their axes in slots which exist in the tips of the branches of the compass. On account of this mobility the fingers of the operator enjoy a corresponding freedom of movement.

When the fingers are in position, that end of the blade which corresponds to the palmar surface and projects beyond, is furnished with a convex button.

When the cephalometer is to be used, the blade is placed between the middle and ring fingers. The hands of the operator then explore any surface whatever wherein a foreign body might occur. If it be a fetal head, the fingers readily recognize it, and wherever they may be, the end of the compass, held between them, is readily arrested and retained by the object sought.

In this manner we may easily determine the extremities, and as a consequence the extent of any diameter whatever.

2. The graduated arm of the instrument is divided into millimeters. It moves freely in a groove, which is provided with an index, by which the separation of the buttons may be readily read off.

What are the results obtained by this method?

During the interval between Jan. 1 and Nov. 1, 1893, 80 fetal heads were measured during intrauterine life. In these 80 cases, the average error in calculation was 1.9 mm.. Nine times the extent of the bi-parietal diameter was exactly computed. Thirty times the measurement was too large, the average error being 1.96 mm.; and forty-one times it was too small, the average error amounting to 1.92 mm. Since this series was obtained, we have continued to employ our method, but have restricted it largely to cases of contracted pelves.

In 1897, M. Dubrisay and myself presented to the Obstetrical Society of France, 14 new cases of mensuration of the head in contracted pelves. In these 14 cases the bi-parietal measurement was exact in 4; there was twice an error of over 2 mm., while in 8 the average error was less than 1 mm. In this series there were three cases which were of special interest, in that the determination of the measurement enabled the women to escape a symphysiotomy at term.

In 1897, two theses appeared on the subject under consideration.

In that written by Constant, we find 16 cases recorded, in which the bi-parietal diameter was measured before and after labor. In 5 of these cases the results were exact. In 5 others the error amounted to 1 mm., in 4 to 2 mm., and in the remaining 2 the error was respectively 7 and 17 mm.

In Denys's thesis, the same method was employed. Before we give this author's results, let us determine as to a point which might lead to much confusion. Denys states that external cephalometry, employed for a long time by Tarnier, has for its aim to measure, through the abdominal wall, the occipito-frontal diameter, and to then deduce the bi-parietal measurement.

But there were two favorable cases, in which he was enabled actually to measure the bi-parietal diameter through the abdominal wall. At this point external cephalometry, as employed by Tarnier, comes to a halt.

Denys next informs us that the average thickness of the abdominal wall is 2.5 mm. to 3 mm., and that it is necessary to subtract from the gross bi-parietal diameter about 5 to 6 mm. This figure agrees with that usually found by us.

With regard to the relation which exists between the two diameters O.F. and B.P., we agree with Denys, that this relation diminishes the further off we are from term, and the amount necessary to subtract from O.F. to get B.P. is smaller toward the seventh or eighth month than at term. As the number of our cases is considerably larger than Denys's, we believe that at the eighth month, the difference between the two diameters is only about 20 mm. (at term 25 mm.).

Let us now inspect the results obtained by Denys, whose material amounts to 45 cases. In 10 of these he measured the B.P. exactly. In 27 cases the error did not exceed 5 mm., and the average error was 3.6 mm. In 8 cases the miscalculation exceeded 5 mm. The largest errors were respectively 6 mm. (once), 7 mm. (4 cases), 8 mm. (twice), and 15 mm. (once).

Denys's results are not quite as good as our own, but that comes, as he himself says, from a lack of experience on his part.

A point of great interest is the statement by Denys that in 7 cases he practiced external cephalometry in breech presentations. Of this series the measurement was exact in 1 case, while the errors were as follows: 1 mm. (once), 2 mm. (once), 3 mm. (twice), 5 mm. (once). In the remaining case the measurement could not be verified, because basiotripsy became necessary during delivery, but the results of the cephalometry had permitted the catastrophe to be foreseen.

In 1898 Dardel's thesis appeared, his work having been done at the Clinique Baudelocque.

It is remarkable that all the literary work done at this hospital for some years past appears to have no further aim than that of showing that symphysiotomy is the sole, the unique treatment for contracted pelvis. In fact the authors only mention other modes of intervention to proscribe them, and do not appear ever to consult the wishes of the patients.

Dardel admits with La Torre that the fetus acquires the same development in weight and volume whether the pelvis is well formed, or contracted. He then reviews all the various methods which permit us to determine approximately the dimensions of the fetal head. His material embraces 200 cases

of labor at the Clinique Baudelocque. He tells us, after his researches, that there is no concordance between the fetal weight and diameters of the head. He neglects, however, to inform us as to who made these measurements, and if it were not himself (and it probably was), they possess no value, and no serious conclusions are to be drawn from them.

The author finally arrives at external cephalometry. He sets forth our method, as indicated by us, stating that it is often very difficult to differentiate the occiput. But it is of no value to make this differentiation, and for our part we have never sought to distinguish in the course of our researches which end of the head was frontal, and which occipital; for the diameter O.F. must be the same as the diameter F.O.

The only error which could be committed, and which certainly often is committed is the placing of the cephalometer button at a point not exactly in the center of the forehead or occiput. But in cases of this sort the error will not exceed half a millimeter, and may therefore be disregarded.

Dardel next endeavors to show that the difference between the diameters B.P. and O.F. is often far from amounting to 25 mm., and he cites in proof 40 cases where he has measured both diameters. Forty cases, however, are too few to disprove a fact known by all authors, when the children (as in his cases) weighed over 3,000 gms.

In looking over his 40 cases, we note that in 6 of them the two diameters presented the normal difference (25 mm.) In 24 cases the difference was either above or below that figure, but the variation did not exceed 5 mm.; and when we recall the fact that the B.P. diameter may be reduced to the extent of 5 mm. by uterine contractions, we should only conclude that in these 24 cases accouchement was possible. Ten cases remain, in which the difference was over 5 mm. But this series of 10 cases is not large enough to invalidate our results.

Dardel, however, concludes that it would be better to employ a "palper-mensurateur" which does not take account of the head alone, but of the relations which exist between the volume of the head and the pelvis.

We have never had any intention of doing away with the use of the "palper-mensurateur"; on the contrary we are well convinced that it often furnishes valuable indications. It is necessary, however, to admit that, for one thing, it is not



always applicable; and, again, that results obtained by its use are often inexact. It cannot be employed in breech cases, and its use is impossible in nervous women, in vicious insertion of placenta, in hydramnios, in thick abdominal walls or in women in whom uterine contractions are readily excited.

Finally, in cases of false lumbar promontory, asymmetric pelvis, tumor, etc., when the head is strongly applied to the symphysis, the "palper-mensurateur" appears to indicate that delivery is impossible; this, however, is not really due to disparity between head and pelvis; but because the vertebral column throws the head forward so that it cannot engage.

*En resumé*, external cephalometry, even when performed by an inexperienced person, is able to give valuable results, while not entirely destitute of faults.

We are now ready to demonstrate this claim by showing what it has done when applied to artificial premature delivery. In Weill's thesis, 1899, we find 8 cases reported from Tarnier's clinic, from Jan. 1 to Nov. 1, 1898. In 2 of these the B.P. measurement was exact, while in 6 others the error did not exceed 1 mm.

At Tarnier's clinic, where the cephalometer is in constant use, it is always employed in cases in which artificial premature accouchement is under consideration as the best method of saving mother and child.

During the school-year, 1898-1899, which begins Nov. 1, 1898, there were 14 artificial premature deliveries for contracted pelvis at the Tarnier clinic. This series of cases is given in full.

[Of these 14 cases, 11 occurred in the practice of Budin, while 3 were Maygrier's cases. Owing to want of space, but 3 of this series can be reproduced in this connection.—  
ED. OBS.]

*Observation I.*—No. 1518 (BUDIN). Premature Delivery Induced by Vaginal Tamponnade. Contracted Pelvis, Diagonal Conjugate, 10 cm. Spontaneous Delivery.

V., aged 26. Parents healthy. Walked at 18 months. Health always good. Menstruated when 13; regular, lasts 8 days. When 22, had twins at 8½ months; labor normal, but hemorrhage during extraction of placenta. One child lives; the other died at 20 months, of insolation.

Second pregnancy,  $2\frac{1}{2}$  years ago. Labor at 8 months; normal; child living and well.

Now pregnant for the third time. Last menses, Feb. 12-20, 1898.

External Inspection: Stature low, spine normal, legs bowed. Tibial and femoral parenthesis. Frontal bosses prominent. On Nov. 3, fetal head movable at superior strait, back to right. Bi-parietal diameter of fetal head, 9.2 cm.

Per Vaginam: Cervix long, soft and permeable; pelvis generally contracted; Diagonal Conjugate, 10 cm.

False Lumbar Promontory: Fifth lumbar vertebra palpable as high as the fourth cartilage:

Woman admitted Nov. 3, 1898.

It was immediately decided, by reason of the dimensions of the fetal head, that pregnancy ought to be interrupted. M. Chavam cleansed the vagina with antiseptics, and filled it with iodoform gauze. Next morning M. Budin saw the patient, agreed with the diagnosis, and found the cervix partly effaced, and open to a considerable extent. There were intermittent uterine contractions, but no real pains. Debut of labor evident from sanguinolent discharge.

M. Budin advised that labor be not arrested, but rather hastened, and at 11 a.m. iodoform gauze was introduced into the cervical canal as high as the internal orifice. The contractions had become stronger and painful by 2 p.m. The woman was then carried to the accouchement ward and watched. By 7 p.m. pains regular and energetic. The head, however, was held back by the contracted brim, and showed no tendency to engage. The cervix was completely dilated at 10.30 p.m., the waters were ruptured artificially, and the head was found at the superior strait, inclined on its anterior parietal in such a way that the latter structure could be explored by the finger throughout, the latter barely succeeding in reaching the sagittal suture, directed towards the side of the sacral concavity. The large fontanelle was almost in the centre of the pelvis, a little to the left; while the lesser fontanelle was reached with difficulty at the right innominate line. The anterior ear was not accessible.

The uterine contractions caused the head to incline to a further extent. The sagittal suture approached nearer the sacrum. The anterior parietal descended. Then suddenly

the head rectified itself, entered the excavation and was on the perineum. It was always in direct transverse.

At this instant a slight degree of posterior asynclitism was produced. Then, aided by pressure made with two fingers of the right hand in front of the anterior ear, rotation was effected by two pains. Delivery of the head immediately followed at 11.45 p.m.

The uterine contractions had been extremely energetic. It was possible to see outlined through the abdominal walls, a constriction opposite the contraction-ring, which gave the uterus a sort of figure of 8 contour.

The last of the amniotic fluid was stained with meconium. The trunk and limbs were born by midnight. Perineum intact.

Placenta delivered at 12.10 a.m., natural. Traction had been made on the cord, membranes coming away intact.

Weight of placenta, etc., 380 gms. Length of cord, 50 cm. Weight of child, 2,500 gms.; male. Required re-animation.

Diameters taken before birth: Occipito-frontal, 11.5; bi-parietal (estimated), 9 cm.

Diameters after delivery: Occipito-frontal, 11.5; bi-parietal, 9 cm.

*Observation II.*—Author's Case No. viii. No. 252 (Budin).

Patient a II-para, admitted to clinic Jan. 19, 1899. Ancestry good, personal health always good. Did not walk until 5 years old. Menstruated at 15; regularly, no pain.

First pregnancy in 1888. Labor at term, very difficult. Delivered by the aid of anæsthesia and forceps. Child did not survive long. Second (present) pregnancy; last menses, May 12, 1898. Gestation normal, save for a few varices on legs. Felt motion in September. Heart and lungs of patient sound. Stature short; sternum very short. Abdominal palpation revealed vertex-presentation; head not engaged. Vaginal touch reached promontory; diagonal conjugate, 10.5 cm. Cervix permeable; torn on right side. Fetal heart to right, normal.

On Feb. 15, the bi-parietal diameter was calculated to be 8.4 cm.

On Feb. 21 decided to induce labor; the bi-parietal, again estimated, being 8.7. Iodoform gauze introduced into cervix. Some pains during day and first part of night. Next day placed in accouchement ward. Cervix open to the extent of 3 cm.; not wholly effaced. By noon, os admits a finger. Tamponnade. On the 25th, dilatation proceeding very slowly, Tarnier's dilator employed, and left *in situ* over an hour. Cervix now fully dilated. Membranes ruptured artificially. Amniotic fluid normal.

The head was high up in the superior strait; no tendency to engage. No sero-sanguineous loss. It was deemed necessary to terminate the labor, the woman being enervated by the prolonged intermittent pains, which were inefficacious. She was placed across the bed, and M. Budin decided upon version, for it would have been hard to grasp the movable head with the forceps.

The vertex was presenting in the left transverse position. M. Budin introduced his left hand, seized the feet and drew them down. The child was readily turned in the intervals between the contractions. An assistant at the same time compressed the fundus, and the trunk and limbs were readily delivered.

The head was extracted slowly and carefully, in the interval between the contractions, with two fingers of the right hand in the child's mouth, and two fingers of the left hand upon the shoulder. At the same time, expression upon the forehead.

The child required reanimation. It weighed 2,650 gms.

The bi-parietal diameter measured 8.6 cm.; it had been estimated within the uterus at 8.7 cm.

The third stage of labor, puerperium and condition of child all normal.

*Observation III.*—Author's case No. xiv. No. 1350 (Maygrier). Contracted Pelvis. Artificial Premature Delivery. Version. Forceps. Living Child.

Patient aged 22, I-para, admitted to clinic Sept. 15. 1898. Mother tuberculous. Others of family well. Good personal history. Age when walked not learned.

First (present) pregnancy. Last menses, Jan. 15-19, 1899. Gestation normal.

Admission to Clinic: Stature short (about 4 ft., 6 in.) Incurvation of leg bones. Hands short. Sternum prominent.

External Diameter of Pelvis: Interspinal, 20.5 cm. Inter-crystal, 25.2. Baudelocque, 16.2.

Abdominal palpation showed uterus three finger's breadths from the xiphoid cartilage.

Head movable at superior strait; back to right side; cervix long and firm. The pelvis examined under chloroform was found to be generally contracted, the right side a little the larger, promontory elevated, and the diagonal conjugate diameter measured 9.7.

Oct. 18th, external cephalometry made the bi-parietal diameter 80 mm., and by the 23d he had outlined the length at 82 mm.

M. Maygrier decided to provoke premature labor. On the 26th the patient was anæsthetized, and placed in the obstetrical position. The fetal head was movable above the pelvis, and the cervix closed.

M. Chavane forced his fingers slowly into the cervix as high up as the internal orifice. Two fingers could not be introduced, so that iodoform gauze was next employed. No progress having been made after a number of hours, recourse was had to Tarnier's dilator. This instrument was used alternately with the tampon of iodoform gauze. After some 12 hours or more, a Champetier de Ribes bag was substituted for the dilator. These attempts to dilate the cervix were extended over 48 hours, and finally the woman was anæsthetized, and the dilatation completed with the fingers by Bonnaire's method. The waters were then ruptured and version begun. The right hand was introduced, and a search for the foot was made. Turning was readily effected. During extraction of the trunk the fetus was rotated to bring the occiput to the right side, which, as has been stated, was the largest in this pelvis. The arms were then delivered, and the fore and middle fingers of the right hand introduced into the infant's mouth, while the same fingers of the left hand were placed across the shoulders. Traction was then made on the lower jaw, while an assistant practiced expression. The head cleared the superior strait, but was arrested by the rigidity of the perineum, which rendered the Mauriceau manœuvre impossible. Cha-

vane therefore applied the forceps, and succeeded in slowly extracting the head without wounding the perineum.

The child required reanimating. It weighed 2,500 gms. The bi-parietal on the day of extraction was 81 mm.; on the following day 82 mm., which corresponded exactly with the results of external cephalometry.

What are we to conclude from these observations?

There was neither mortality nor morbidity among the mothers. With regard to the children, 3 of the 14 succumbed, an infantile mortality of 21.4 per cent. All the other children left the clinic in good condition. One child died of umbilical infection. One patient was not seen early enough for the most favorable conditions. She refused operative interference which was clearly indicated (symphysiotomy or Cæsarean section). †The B.P. diameter of the head was 1 cm. longer than the diagonal conjugate diameter of the pelvis. The child was very large, weighing 3,550 gms.; it was still-born, and could not be re-animated. In the third fatality, the child likewise died of umbilical infection. As there is no doubt that symphysiotomy would have saved the second child, there was really no mortality due directly to premature delivery. Isolation, which was not practiced at Tarnier's clinic, would have saved the two cases of umbilical infection.

Taking now the practice of external cephalometry as a whole, and adding together the cases of Perret, Dubrisay and Perret, Constans, Denys, Weill and the present series, there appear to be some 186 cases which have been published. Of this number, the calculation of the B.P. diameter was exact in 36, in 140 the error did not exceed 5 mm., while in 10 cases only did it exceed the latter figure. Of these 10 cases, 8 appear in the thesis of Denys.

In one of the series reported in the present article, there was an error of 7 mm.; but it should be noted that this woman, who had undergone a symphysiotomy before her pregnancy, was, by reason of sensitiveness and adhesions, in an unfavorable condition for abdominal manipulations.

From what we have just learned, it clearly follows that the treatment of contracted pelvis ought to consist, in many cases, of the induction of premature labor at an epoch at which the fetus, having attained sufficient development to assure its vitality, should still be able to clear the pelvic brim.

External cephalometry is a potent factor in indicating in a precise fashion the moment at which labor may be induced.

It permits us to wait, without being unduly dependant on the date of the last menses, until the fetus has attained its greatest possible development short of that degree which would prevent the head from clearing the pelvic brim.

In 5 of the 14 cases this point is especially to be noted. All these women, according to the date of last menstruation appeared to be at term when it was proposed to induce labor. External cephalometry, however, told us that the volume of the fetus was not in harmony with the age as calculated from the date of last menses.

In the most typical case of this series, the woman according to her menses ought to have been at term at the end of October; but the bi-parietal diameter, measured Oct. 15, was only 80 mm. By Oct. 25, it was 83 mm. and in thus following the development of this fetal head it was not until Nov. 20—almost 10 months after the close of the last period—that external cephalometry informed us that it had now become necessary to induce labor. The child weighed 3,220 gms.

In another case the woman could give no data as to the time of her last menses. Cephalometry cleared up all uncertainty, and labor induced on Dec. 20 resulted in the birth of a child weighing 3,220 gms.

It should be remarked that out of all these (14) premature children, only one could be regarded as weakly. All the others weighed over 2,500 gms., and the exception was the very case in which there was an error of 7 mm. in estimating the bi-parietal diameter, this error being due to the results of a previous symphysiotomy.

Finally, in order to obtain the best results, it is better for the accouchement to occur spontaneously. To secure this desideratum, we should not be in too great haste to interfere, unless either mother or child is threatened, and to whatever manner we have recourse, it is certain that although the mother's life is not hazarded, the same cannot always be said of the child.