THE INDUCTION OF LABOR IN NORMAL PELVES AT TERM[1]

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THE physiological duration of human pregnancy is as yet known only approximately, and the factors that determine the onset of labor are even more obscure. Nevertheless, we do know that while gestation may vary normally from 240 to 330 days, yet the child is fully mature in 275 days of accurately observed time.[2]

Von Winckel also shows that the continued growth of the child *in utero* after maturity brings with it an increasing danger of morbidity and fatality both to the child and to the hostess and by operative complications greatly intensifies the obstetrical problem.

Thus the time for the beginning of labor is by no means an indifferent matter, nor is it an affair that should be left altogether to accident or to the uncertainty of chance or physical idiosyncrasy. We surely should give to the human family the amount of attention and care the horticulturist bestows upon his apples. The apple is picked at maturity—why not the child?

Is it not possible in the conduct of labor to replace obscurity and uncertainty by clarity, conviction, and method both in its beginning and in its end; to replace the "watchful waiting" of the midwife by the wise control of the scientist; in a word put obstetrics where it belongs in the domain of clean surgery?

During the past year the writer has been seeking, at Wesley Memorial Hospital, to simplify and regulate the course of labor along the line of a high surgical conservatism. The primary question is, Can we assure ourselves that the child is mature and, given a mature child, shall we determine the onset of labor?

The writer believes we can and should do these things and herewith presents some preliminary observations for consideration and record.

The estimation of the child's maturity has been a most interesting study, for babes may be mature and show great differences in size and weight. For this reason it is necessary to strike an average and take advantage of the generous latitude which Nature allows in all her processes. We, therefore, assume that a mature child is 50 cm. long and weighs between five and eight pounds; for we fully accept Von Winckel's dictum that a child of more than eight pounds is a post-mature child in 70 per cent of the cases. Undoubtedly, to base any procedure upon such an assumption demands that judgment be assisted by a keen intuition and corrected by a constantly growing experience. Nevertheless, the results have been highly satisfactory. In other words, while the method does not possess an astronomical accuracy, yet, in practice, it works.

In addition to the routine measurements of the pelvis, we obtain our estimate of the child's size, first by its length according to Ahlfeld's rule and then its comparative head size by Mueller's method of crowding the head into the pelvis. In our series of cases the length of the child rarely varied more than 2 cm. from the actual post-partum findings and usually was as close as 1 cm. or less. The variation also was safely below rather than above the actual figures.

Thus Ahlfeld's rule, which hitherto has possessed merely a remote academic interest, becomes practically important. The rule is simple. In vertex cases measurements are made with the pelvimeter from the upper border of the symphysis to the breech of the child, the result is doubled and 2 cm. subtracted for the thickness of the abdominal walls. The result is the length of the child. Additional information may be obtained in special cases through a comparison of the head of the child with the maternal pelvis by the Mueller maneuver under anæsthesia. Consideration of the cephalic index of the parents also has a certain value.

Our figures are again corrected by the

[2] Von Winckel. Duration of pregnancy. Deutsch. Klin., 1914.

[1] Read before the Chicago Gynecological Society, November 19, 1915. (For discussion see page 370.)

history of the case, the last menstruation and the day of quickening. If the patient is intelligent, both of these facts are of great value when considered in relation to the anatomical findings. We accept seventeen weeks from conception as the approximate date of quickening and usually count twenty-two weeks from this day as the culmination of the pregnancy. The calculation is not absolute, of course, and sometimes a week more is allowed depending on the parity of the mother and her degree of intelligence. If the history and the anatomical findings are harmonious the day for the labor is definitely appointed.

The next step is to have the labor come on at the time set. The work may be done in any aseptic environment, but the hospital is preferable. The patient receives attention to the bowels the night before and in the morning is given careful obstetric preparation of external genitalia. Then under strictest asepsis a Voorhees bag is introduced *without* rupture of membranes. Brodhead's report of 139 cases in 1912, is pioneer work in this field and has not received the attention it deserves.

Our technique is as follows:

Assemble and sterilize by boiling 20 minutes, a Voorhees bag No. 4, a Simon speculum or vaginal retractor, a pair of long Pean forceps, 2 pairs vulsellum forceps, 1 dressing forceps, 2 pairs compression forceps, a Goodell dilator, 1 tenaculum forceps, a hand bulb syringe with glass tubes and rubber connections for the bag.

The patient, prepared as for delivery, is placed upon the table in exaggerated lithotomy position. Stirrups will serve.

The vagina is retracted, a smear made from the cervix, and the mucous membrane wiped clean with pledgets of gauze on forceps.

Anæsthesia is only occasionally necessary even in primiparæ.

Before using, the apparatus must be tested by forcibly filling the bag with sterile solution.

One lip of the cervix is seized by the vulsellum forceps and brought down. Usually even in primiparæ, the os is sufficiently patulous to admit the bag; if not, dilate.

The bag is emptied of residual air and fluid and the flat end pulled out. It is now rolled up into a compact mass like a cigarette and seized with Pean forceps, so that the tips extend just to the largest diameter of the rolled bag. Anoint with sterile glycerine, turn the curve of the forceps toward the patient's left leg, and introduce. As the bag enters, turn the mass to the operator's left—a quarter turn—so that when the operation is completed the forceps curve looks upward. Release lock on forceps. Connect tube with syringe and force sterile solution slowly into the bag. Pean forceps may be removed as bag fills. Remove vulsellum. Tie tube with tape when bag is full, disconnect syringe. Put sterile pad on either side of tube.

If pains do not start within an hour, or if compression is desired as in placenta prævia, or a more rapid dilatation, then a weight of one or two pounds is attached by a tape to the protruding tube and passed over the foot of the bed. Usually in from five minutes to half an hour contractions begin and labor has been inaugurated just as one would start the pendulum of a clock.

In a variable period, rarely more than four hours—three hours and twenty minutes was the average in our series—the bag is expelled by strong pains, the dilatation is practically complete, the head follows the bag down, the membranes rupture, and the second stage begins. From now on the case is managed according to general obstetrical principles. If the pains are weak and shallow, pituitrin may be indicated; if strong and regular, morphine and scopolamine or gas or chloroform may be added. The tedious, exhausting, and painful first stage has been materially shortened and definitely controlled. The bag acts as a dynamic stimulant to the contractions, as well as a mechanical aid to cervical dilatation, and it preserves the membranes from injurious pressure until physiological rupture occurs.

Theoretically there are two objections to this procedure which were ever before us: The possibility of infection was the one most dreaded. Hence for months we made smears from the vagina and cervix of all

cases. Naturally we found every variety of pathogenic organism, including the streptococcus, staphylococcus, and gonococcus. The bag was introduced nevertheless and none of these women had temperature postpartum. It is our belief that the shortening of the labor process and the preservation of maternal vitality maintains the maternal immunity and prevents the infection that would easily and probably follow a more prolonged labor whether induced or uninduced. If this should prove to be true, we may ultimately look back on the policy of "watchful waiting" as an evasion of responsibility that is unjustifiable.

The second danger is the possibility of prematurity. This happened once in our series. The case was not supervised and an interne, who had made enough measurements for educational purposes and was supposed to be reliable, measured the uterus instead of the fœtus and the result was a seven months' child. This danger is practically nil when proper care is used.

It has been urged as an incidental objection to the bag that it frequently changes the position of the presenting part. We have found this to occur demonstrably only two or three times and not unfavorably. In fact in several instances the attempt has been made to secure such a change, but the Voorhees bag with its flat top does not lend itself readily to this object.

The results obtained by the use of the bag in a series of one hundred consecutive cases are herewith submitted.

Primipara, 35; multipara, 65; average duration of labor, seven hours forty-five minutes; shortest labor fifty-five minutes; longest labor, thirty hours in a primipara with a cartilaginous cervix and twenty-eight hours in a multipara with much cicatricial tissue in the cervix.

The bag broke, during or shortly after insertion, six times, and was reinstated three times. The average time for the expulsion of the bag was three hours twenty minutes. The membranes were ruptured by the introduction of the bag twice.

There were two maternal deaths: one from placenta prævia complicated with myocarditis and one from pneumonia eight days after labor. Neither death can be charged to the bag.

The average weight of the babies was 7.7 pounds, the smallest child weighing 5 pounds and the heaviest 10 pounds five ounces.

Seven babies died; one, the child of a primipara after a spontaneous labor of sixteen and a half hours, was born in asphyxia pallida, was revived with difficulty, and died eight hours later. The second, the child of a multipara, was born blue after a spontaneous labor of one hour and thirty minutes, was revived, and died suddenly thirty-six hours later. The third and fourth children died from compression of the cord by the head at the outlet, one of these being also syphilitic. The fifth and sixth were delivered with forceps from primiparæ with contracted pelves; one in the occipitoposterior position was stillborn, the other lived two hours. The seventh child was delivered prematurely. This is the only case attributable to the method and we believe it was wholly unnecessary.

There were three cases of version and extraction, for placenta prævia, transverse presentation, and prolapsed cord. There were four cases of breech presentations, two of placenta prævia, one of prolapsed arm, one of mitral stenosis, one of mitral insufficiency. There were 17 cases of lacerations of the perineum, of 2 degrees or less, and episiotomy. One case presented grave albuminuria.

Forceps were used in 23 cases as follows: Axis traction in 2; low forceps for occipitoposterior position of head, 9; deep transverse arrest, 8; insufficiency of the powers, 4. Four of these might be called *schulezange*.

Seven cases had post-partum temperature: Case 1 had pulmonary tuberculosis with evening rise of temperature. Case 2 had pneumonia. Case 3 had a temperature due to mastitis, which went to 102°, lasted twenty hours on the third day, and disappeared under the ice pack. Case 4 had a temperature on the ninth day which went as high as 105° and was probably due to an old pelvic infection or to the nurse who had a suppurating injury of foot which she did not report until too late. This temperature ran two weeks and developed a mass in the pelvis which ultimately absorbed. Case 5 had a temperature due to the prolonged labor —30 hours—which went to 102° on the second day and lasted for three days. There were no pelvic symptoms. Case 6 had a temperature due to colitis. It was 104° on the fourth day and lasted 24 hours. There were no pelvic symptoms except the diarrhœa. Case 7 suffered a temperature due to nervousness and after-pains. On the second day the temperature was 102° and remained so for twelve hours. There was no pelvic tenderness and the temperature subsided under bromides.

In no case except Case 4 was there tenderness over or beside the uterus; neither foul discharge or subinvolution. None of these cases, therefore, unless it be Case 5, can be attributed to the bag.

In only one case was post-partum catheterization necessary as compared with former methods of delivery.

The writer ventures to call attention

particularly to the number of forceps cases, which is far higher than the number reported from most clinics. It is quite probable that some of the occipitoposterior positions would have rotated and that a certain number of the arrested heads would have delivered if time enough had been allowed.

But it was a deliberate part of this investigation to shorten the labor wherever it could be done without increasing the danger of injury to the mother or child. It was thought, and we now believe wisely, that by preserving the maternal vitality and immunity the advantage would more than counterbalance the slight increase of danger involved in the interference. It is more than probable that in skilful hands the courageous use of forceps is safer for mother and child than a timid reliance on the aimless powers of Nature with the possibility ever present of an ultimate employment of forceps. At the same time it is not felt that the resort to instruments has been in any degree hasty, for before external aid is decided upon our routine requires that we ascertain the position of the head; that we learn the character of the pains and know that dilatation is complete. Then, if necessary, pituitrin is used to strengthen the pains and a time limit is allowed for molding and delivery of the head, which approximates one and one half and two and one half hours in multiparæ and primiparæ respectively.

The absence of infection in the cases where pathogenic organisms were present is extremely interesting and significant since it may ultimately prove that bacteria are a relatively negligible factor in short labors. Furthermore, as the work has gone on, we have all been more and more impressed by the freedom from post-partum exhaustion and nervous prostration in these cases and their quick convalescence. This can hardly be unexpected since a process that shortens labor anywhere from four to twelve hours must necessarily result in a tremendous saving of energy and vitality. Our observations thus far lead us to believe that the bag can be used freely and harmlessly both in primiparæ and multiparæ and in normal as well as pathological cases. It removes and overcomes the principal obstacle in a majority of labors—the undilated cervix—and leaves us only the bony pelvis as an obstruction and this too in a patient whose strength is as yet unreduced.

The only exceptions we are inclined to consider at present are the multiparæ with much cicatricial tissue in the cervix and primiparæ where the same part is thick and hard. These are difficult cases however under any circumstances and it is probable that our experience in future will show that such women have far more satisfactory labors *with* the bag than without it. Moreover these cases are close to pathology and should be considered separately—in the class with contracted pelves.

The highest advantage of our procedure lies in the fact that the course of labor is entirely under the control of the obstetrician from start to finish. There is no timidity, indolence, or dubiety. The day is appointed; the cervix is dilated slowly or quickly, the contractions are strengthened or weakened; the pelvis is enlarged or let alone; complications are boldly met or foreseen and avoided; the labor is hastened or prolonged; the pain is permitted, diminished, or abolished according to the judgment of the operator. The process works in strict harmony with the principles of modern science.

CHICAGO GYNECOLOGICAL SOCIETY

REGULAR MEETING HELD NOVEMBER 19, 1915, WITH THE PRESIDENT, DR. CHANNING W. BARRETT, IN THE CHAIR

INDUCTION OF LABOR

DR. CHARLES B. REED read a paper entitled "Induction of Labor at Term: A Report of 100 Cases." (See p. 294.)

DISCUSSION

DR. J. CLARENCE WEBSTER: I was working in Europe when the Champetier de Ribes bag was introduced into practice, and was one of the first, outside of France, to employ it. I very soon became convinced of its advantages, and have used it ever since as the best means of inducing labor. In recent years I have preferred the American form of the bag as it is lighter in construction and cheaper.

Dr. Reed's paper is a plea for the induction of labor on a date fixed by the obstetrician after he has convinced himself that the fœtus will be fully matured at that time, in preference to allowing Nature to take its course.

Such a proposal is likely to meet with violent opposition in the medical profession, especially among those who believe that Nature is usually right and should be allowed to take its course. Dr. Reed must be well-fortified with good arguments to prove that his procedure is more advantageous for mother and child.

Induction of labor is a well-recognized method of delivery, and has in the past been restricted to special cases. When carried out in a hospital, under expert care, it is attended with very little risk. If Dr. Reed means to suggest that it should supplant Nature's method in general practice and find universal employment in the profession, much harm will be done. The procedure necessitates a thorough aseptic technique, some manual dexterity, and continued watchfulness, such as best exist in hospital practice.

Dr. Reed speaks confidently of being able to determine the maturity of the child with accuracy. I cannot agree with him. Until we know when conception begins we cannot be certain as to this point. All the data on which the determination of the maturity of the ovum is based are variable; e.g., the escape of the ovum from the ovary, the length of time of its passage to the ovary, relationship to coitus, the meeting of spermatozoa and ovum, relationship to menstruation, the size of the uterus or fœtus, the quantity of liquor amnii, quickening, etc.

Dr. Reed relies on Ahlfeld's measurement at term, but most obstetricians regard this as only relatively valuable, and not capable of giving absolute information as to the maturity of the fœtus. Variations in the size of the full-time child are so obvious as to make one skeptical as to the reliability of Ahlfeld's method. With all the data at our disposal we may often be in error two weeks or more.

However, as Dr. Reed states, there is apparently little difference, as regards vitality, between a full-time fœtus and one short of term by a week or even more. Consequently, the opposition to his procedure must be considerably minimized if this standpoint is alone to be considered, because an expert obstetrician would rarely make an error of such importance, in estimating the maturity of the fœtus, as to greatly lessen the chance of its survival.

I have long held that premature labor is advisable in cases in which the obstetrician in convinced, from a consideration of all available data, that pregnancy is continuing longer than the average, particularly where the fœtus is large. Induction of labor in such cases probably reduces the risk both to mother and child.

Dr. Reed has called attention to one great advantage of labor induced by the bag — the shortening of the first stage.

In the great majority of cases when the pains begin they continue to recur with shortening intervals until dilatation is completed. Occasionally, they may be weak, irregular and extend over a long period of time, but this variety is much rarer than among cases of spontaneous normal labor.

In the Presbyterian Hospital it has been customary to introduce the bag in the forenoon. In the majority of cases labor has not been completed until after midnight. Very few have terminated within six hours, but a considerable number between six and twelve hours.

Occasionally, pains are started and cease entirely. The addition of a weight to the bag is an additional stimulus to the uterus, but as a rule it is safer not to use it. Cases in which labor is induced must be watched carefully, because occasionally malpositions and malpresentations may be brought about. They should be discovered by the time the cervix

is well-dilated so that they may be properly dealt with.

My technique is the same as that of Dr. Reed only in cases in which I cannot dilate the cervix sufficiently for the introduction of the bag with my fingers. Ordinarily, I administer the nitrous-oxide-oxygen mixture for a few minutes while my glove-covered hand is introduced into the vagina. Dilatation of the cervix is usually easily effected with the fingers and the rolled bag is passed along the palm and introduced into the cervix with the fingers.

I consider a rigid cervix as unfit for induction of labor by the bag. It is apt to be unsuccessful. Such a condition is far more suitable to the employment of vaginal or, sometimes, abdominal cæsarean section. Dilatation of the cervix with metal dilators may cause laceration which may be increased with the progress of labor.

Dr. Walter S. Barnes: I have been doing this work for about fifteen years, and in the labors that I have induced during that time I have had no trouble from infection. I have lost no mothers. I cannot give you as accurate reports as Dr. Reed has given you of these cases, but my results have been very much the same. The labors have been a little longer. I introduced into the cervix, after it had been tested out and measured as to capacity, two Barnes bags of large size, which were used in connection with a hand-syringe.

As regards the vulsellum tearing the cervix, I have not used enough force to pull the instrument out through the cervix. As regards rupturing the membranes, it has been the exception. The shape of the bag is such that it allows free exit of any discharge, and there is no chance for the secretions to be pent up. In this respect the Barnes bag has an advantage over the Voorhees bag. The results have been uniformly good.

As to occipitoposterior positions, I have been able to correct these in many cases by introducing my hand into the uterus after placing the patient under complete surgical anæsthesia. If the head fails to rotate with the methods of posture, etc., I push up on the caput, place my hand in the uterus, taking the ear as a guide, apply the other hand to the shoulder and turn to the long axis of the uterus, which is safer than version of the head. I allow the head to come down. If it does not, I introduce forceps and pull it down. Labor will then soon be terminated. I save the patient from extensive damage which we see so often following occipito-posterior presentations with laceration of the perineum.

I think we will all come to see the time when this procedure will be adopted more frequently than it is at present.

Dr. Charles E. Paddock: I hardly know what to say in regard to the strong position taken by the essayist. His treatment of women, at term, is certainly a bold one and in the hands of others less skilled would seem like meddlesome obstetrics. It is so at variance with the teaching of the past generation, and is not sanctioned, as far as I know, by any of the modern textbooks; it brushes aside the attitude taken to "let Nature take her course" as far as possible. Of course, we are progressing, and I will not say that this is not a step in the right direction, but I would be rather reluctant to attempt bringing on labor at a certain time in every case. I make a practice to advise that pregnancy be interrupted if the patient is a few days past term, but I do not insist that such advice be accepted, but when I say a patient is at term I am sure she is so and do not depend upon the measurements of the baby *in utero* to inform me. A majority of my patients are seen a few days after the first missed period and this sign, together with other signs and symptoms soon occurring enables me to say just where this woman is in her pregnancy. In ward cases, or cases seen late in pregnancy, I claim it is impossible to say definitely when the woman arrives at term. If I decide to terminate the pregnancy, my custom is to give the patient quinine and castor oil, which will in over 50 per cent of the cases induce labor. Knowing this, why then should the patient be submitted to the risks consequent upon insertion of a bag?

I cannot agree with the essayist upon the ease with which the bag is inserted; neither do I find the cervix so fully dilated that the bag can be attempted without first dilating the cervix, requiring an anæsthetic; neither do I find the average patient is willing to submit to the operation. Again, I believe that a routine treatment, such as outlined, will cause displacements, prolapse of the cord, and occasionally infection. I am willing, however, to be convinced, and Dr. Reed has kindly consented to permit me to see him at his work.

Dr. Rudolph W. Holmes: There can be no question that the hystereurynter is one of the most valuable adjuncts to obstetric procedures we have. I have never used it in a case I considered normal. However, it has been employed repeatedly, with signal success in pathological cases. For months this question of the induction of labor at so-called term has been intimated, but I had not taken the matter seriously, for there is no more justification in such a procedure than there would be in performing any other obstetric operation without a valid indication. At the present time there is no department of medicine where unmerited censure and criticism are bandied about as in obstetrics. To apply this procedure without indication, in every patient, as a routine, is merely inviting still more opprobrium on a maligned specialty which already has more threats of malpractice than any other branch of medicine. To have a catastrophe happen following the use of the bag in a definite indication is justification in itself, but to have it follow where the reason is largely a matter of the physician's convenience will offer no justification in his conscience, or an extenuation in the minds of the laity. There has been so much heard recently of meddle-

some midwifery in connection with unjustifiable cæsarean sections, and the promiscuous use of forceps, that I believe it extremely ill-advised to recommend this procedure as a routine.

As Dr. Webster has stated, it is impossible to determine the date of maturity positively, as we have no conclusive data as to the date of fertilization. With all the data of the single coitus, date of the last period, day of perception of life, and finally of lightening, one may easily be led astray in determining the date of labor. The determination of maturity by means of the Ahlfeld and Perret methods frequently leads to fallacious deductions, as a large baby may be actually premature while a small one may be fully ripe. As we know positively that it is impossible to fix accurately the date of maturity, so, likewise, without this definite data we cannot say the child is post-mature. Any deduction made one way is equally fallacious for the other. In Dr. Reed's report he shows that one baby was inadvertently brought into the world at the seventh month. Not so long ago a cæsarean section was done at this same period because the operator made a mistake in computing the maturity. This is not a culpable error, but typifies the inexactness of our working knowledge.

The wife of a friend came to me when she thought she was about five months pregnant. The enlarged, discolored breasts contained colostrum; she imagined she felt life; she had not menstruated since a week or two before marriage. Her baby was born 13 months after her wedding. No one would think for a moment she had a pregnancy of that duration. At the time she came to me the uterus was soft and hardly perceptibly enlarged. The fact of an intense maternal instinct, a profound impulse given by married life, or a disturbance of ovarian secretion had produced in her a pseudocyesis. Similarly explained is the woman who came to me, convinced she was pregnant yet there was no uterine enlargement. The baby was born just a year after her first visit. No one would maintain that she had a pregnancy lasting a full year. You all know, by act of Parliament, one of the ducal families of England continues its line uninterruptedly in spite of the fact the heir was born two years after the death of the "father."

I certainly have used the hystereurynter at least a hundred times in pathological cases. In some it is remarkable how quickly and effectively it acts. I recall a placenta prævia where the bag was used, and certainly within ten minutes the bag was expelled, the child delivered by version and extraction, and the placenta removed and the uterus tamponed. On the other hand, all of ten years ago, I repeatedly had to place the bag covering a period of five or six days, without avail, and finally had to secure dilatation by incisions. The bag Dr. Reed shows does not secure full dilatation — it produces a little more than half dilatation.

The fact that Dr. Reed had nine occipitoposterior positions is suggestive. Of course, accidents will happen in one series which may not recur in another, but it is a logical belief that the bag had dislodged the head. Anyone who argues that the bag does not dislodge the head is preaching sophistry or basing a statement on error of observation. It is true in obstetrics as in other connections that two bodies cannot occupy the same space at the same time. If abdominal palpation is invariably followed after the bag is introduced, it will invariably be found that the head is displaced. That good fortune attends us, and the head returns to its earlier position after the escape of the bag does not militate against the statement at all. It is a fact that the use of the bag offers an increased liability of a prolapse of the cord, or some other fœtal member, than is present in normal unaided cases.

It is an inviting proposition to place a bag at a time convenient for the obstetrician, and know that within a reasonable time the case will terminate. But it is a specious argument that it is done because labor is so essentially a pathologic process.

In this connection I cannot see the expediency of using the bag when castor oil, aided by ten grains of quinine, in those who can tolerate the drug, will bring on labor in at least 75 per cent of cases *if the woman is at or near term.* I am convinced that it is exceedingly remote that castor oil will precipitate labor in a woman far from term. If an error is made in the time of the exhibition of the drug no harm is done if it is before term. If the bag is introduced in woman, where the maturity is uncertain, or she has not reached that period, the baby will probably pay the penalty for the error. Castor oil as a means of induction of labor at term is not so spectacular as the introduction of a bag, but at least it does no harm.

DR. RACHELLE S. YARROS: It is true that in the last decade we have all been taught to interfere as little as possible in our obstetrical cases; to watch carefully and let Nature do her work. This is apparently a perfectly legitimate protest against the meddlesome obstetrics practiced by the old midwives and doctors who were continually dilating the vagina, cervix, and giving ergot. Watchful expectancy has served a splendid purpose, and we must not underestimate its value. But with great change in surgical technique, with increased general knowledge and practice of asepsis as well as the growing custom of patients to go to the hospital for childbirth, it would seem that the new ideas for relieving labor pains and reducing the duration of labor through medical or surgical methods, might be considered with greater safety.

As Dr. Webster already stated, the bag is not a new idea. We have all used it in appropriate cases with good results; we have all found cases where the bag could not be used and where the bag remained for many hours without the results that Dr. Reed describes.

The idea of inducing labor at a given time in a perfectly normal case is decidedly a new idea. I am somewhat surprised that Dr. Reed finds no

Crile has demonstrated the effects of exhaustion in the cerebrum and in my judgment Dr. Reed is justified in his statement that the use of the bag decreases mental and physical exhaustion and is an important factor in the prevention of sepsis.

Dr. Carey Culbertson: I regard Dr. Reed's paper as an interesting contribution to our advancement in the management of labor.

As Dr. Webster has said, we have used the bag in the induction of labor at the Presbyterian Hospital after the patient has gone to what we call full time, in uncomplicated cases, for many years with results that have been satisfactory. All of them were not perfect, as not all spontaneous labors are perfect. For some months I have used the method here outlined by Dr. Reed in my private and clinical cases arbitrarily at what we call term. I think that all obstetricians will agree that it does not make much difference whether a baby is born, so far as its condition goes, on the 280th or the 290th day. When they are born at this time, spontaneously, we say the patient is at term. Therefore, I do not see any great objection to inducing labor any time during this period, from the two hundred and eightieth day on. I have been inducing labor in this way, choosing the day when the patient expresses the desire to have her baby, and I see no reason why we should not be arbitrary in that matter. I have not had as many cases as Dr. Reed reports, but I am satisfied, as he states, that the first stage of labor is materially shortened, and the entire labor is shortened from four to eight hours. The second stage, of course, is not materially altered, but the first stage is definitely shortened. As a rule, we put the bag in in the morning, as early as possible, and the baby is born by supper-time or at bed time. In my last case the bag was put in at nine o'clock in the morning and the baby was born at half-past two in the afternoon, the patient's third child.

As far as displacement of the head goes in the introduction of the bag, in a multipara that is relatively unimportant, because in the average multipara the head is not in the pelvis. In the primipara where the head is in the pelvis before labor it has become molded. It may be displaced by the bag but it comes down again as soon as the bag is expelled from the cervix. I have had prolapse of the hand following the introduction of the bag, but not a prolapse of the cord. So far as occipitoposterior positions are concerned, if the head comes down in that position I assume that there is more room for it posteriorly than anteriorly. Its management is not such a difficult procedure, and I see no reason why expert obstetricians should be afraid of occipitoposterior positions. These usually require low forceps extraction, though a certain proportion terminate spontaneously. As a rule, I find that the head returns to the pelvis, as soon as the bag is expelled from the cervix into the vagina. While rubber-bag induction may cause displacement of the head I fail to see how it would prevent anterior rotation since rotation occurs when the head is low, that is, after expulsion of the bag. Occasionally there is a case where labor does not ensue after the introduction of the bag; there are occasional cases where labor cannot be induced by any artificial means, and the patient must be dealt with surgically. But that does not happen very often. Once in 12 or 15 times is the impression I have now of the proportion of cases in which the bag does not induce labor. Where an effort is made to induce labor prematurely, on account of toxæmia, the pre-eclamptic condition, or something of that sort, occasionally labor will not be induced. I have seen two cases of the so-called pre-eclamptic condition where labor did not ensue from the introduction of the bag.

I use a larger bag than Dr. Reed has shown and I have never found it necessary to put the bag in two or three, or four or five times as Dr. Holmes suggested. I should not reintroduce it one day after the other if it were ineffectual. I would let two or three days intervene between the efforts at induction. Indeed, if the patient has not come into labor, the bag should be removed in 24 or 30 hours. I do not find it necessary to employ traction as a rule. Where I do, I use an elastic tube, as Dr. Heaney suggested, which I first saw used in Vienna in 1903. It is important not to make too much traction, not to keep the bag too tight in the cervix. Enough to keep the tube taut is all that is required.

Labor pains come on at once with the introduction of the bag in some cases, and in nearly all there are definite, regular, rhythmical contractions within one or two hours. The pains are more frequent and more prolonged than in a spontaneous first stage. In this way dilatation and effacement are brought about more rapidly and the first stage definitely shortened. Nitrous-oxide analgesia controls the suffering when it becomes as severe as the terminal pains of the first stage in spontaneous labor.

Dr. Mark T. Goldstine: I have had the opportunity to watch Dr. Reed's work closely and have been much interested in it, and can vouch for the results he has stated in his paper. The technique has been worked out carefully, and not only that, he has trained his assistants in the management of the bag so that if Dr. Reed is called away, after the bag is introduced, the case is under the close observation of a person who is skilled in managing these cases.

I think the impression is that the technique of the introduction of the bag is simple. I have just the opposite impression. I do not think that the management of the case, after the bag is introduced, is as simple as one would be inclined to believe from what has been said here tonight.

Dr. Reed's cases have been free from fever and sepsis. I attribute that as much to a lack of vaginal manipulation as I do to his short labor. In the great majority of cases the only intervaginal manipulation would be done with the introduction of the bag, and after that no other examinations

made, and that has some bearing on his lack of morbidity.

I think the work as it is being carried on will impress a great many men with the results, and as Dr. Heaney stated, I would like to see the results from this method in a series of normal cases.

DR. REED (closing): I have been much gratified at the interest that the members of the society and visitors have shown in this paper. It has been, as you can readily understand, a matter of extreme fascination to me to carry out this study. The work as it has gone on from day to day has really made life worth living in a city that is not calculated to stimulate the imagination or the soul.

In regard to the remarks made by Dr. Webster and Dr. Culbertson, I will say that both cover the subject very definitely; it makes little or no difference to babe or mother whether or not the woman is delivered two weeks before the expected time; but it does make a difference if she is delivered two weeks after her expected time both to babe and mother. I would like to emphasize that point because the baby grows with each succeeding week in pregnancy and labor becomes increasingly difficult. Dr. von Winckel has demonstrated thoroughly and completely that point, and I refer you to his paper published in the *Deutsche Klinic* for 1904, for an elaboration of the subject.

I agree with Dr. Webster as to the difficulties we encounter from a rigid cervix. I think I would rather encounter a contracted pelvis any time than these abominable, cartilaginous, fibroid conditions of the cervix, which make the life of the obstetrician so atrociously unpleasant.

Dr. Paddock made use of the term "meddlesome obstetrics." I had expected something like that. I used to hear the term applied to surgery—meddlesome surgery—when somebody opened an appendiceal abscess. I remember it distinctly. The fact of the matter is, are we going to allow midwives to attend to these cases or are we going to control the process from beginning to end ourselves? That is the point. Shall we control labor, or shall we shirk responsibility? I do not mean that this is a method that the general practitioner is going to adopt universally; not at all, but for us who are engaged in this special line of work, let us as men take the responsibility for it ourselves. Dr. Paddock remarked that he could not get his patients to consent to it. I wish you could see our patients at Wesley Hospital. As the patients come back into the ward day after day with the introduction of the bag and the termination of labor in three, four, and five hours relieved of their burden, the waiting women crowd up with, "Doctor, when can I have mine? When are you going to take me? Why cannot I come tomorrow?" Every day we hear such expressions. There is no difficulty if you have control of your patient. I say to my people, "I can shorten labor from four to eight hours. Do you want to do it or shall you let Nature do it?" We do not insist on it. It is a matter for the mothers themselves to choose unless the ward is full. Then we ask them to take the bag or go out and come back.

As to the introduction of the bag, Dr. Paddock and others have manifested a reluctance to do it without an anæsthetic. I would like to say, that my associates at the Wesley Hospital see one bag introduced, and after that they do it themselves without any trouble. My internes will put in the bag without giving the woman an anæsthetic, without any difficulty whatever. Is not that true, Dr. Long?

DR. LONG: Yes, sir.

DR. REED: They introduce the bag without any trouble whatever, month after month, and there is no difficulty connected with the technique. It is a matter that anybody can learn providing he has the mechanical or manual dexterity which enables him to do obstetrics at all and do it right. I have no trouble. The boys at the hospital who are attending this service have put the bag in at nine o'clock, and the woman is delivered at three and at six in the afternoon. Of course, I do not believe in the long duration of these cases. I do not believe in the prolongation of bag-retention, and yet when I think of the old methods that we employed in pathologic cases some years ago, such antiquated and timorous technique for instance as the use of iodoform gauze, which bares with it all the evils of every half hearted measure. The gauze stuffed up into the cervix merely starts absorption at once and when it is left there for twenty-four or thirty-six hours the danger can be imagined; or considering the introduction of the rectal tube which is left forty and fifty hours in the old days. It seems to me that the introduction of the bag which stays only for eight hours in the great majority of cases is pretty good obstetrics in the light of these archaic methods which are still advocated by men who should know better.

As to the use of castor oil and quinine, in many cases it is doubtless a valuable method. If the woman can be delivered with quinine and castor oil, let her be so delivered. The thing is to deliver her at the time we say and make the delivery as painless as possible. That is what we are trying to do. In the olden times frankly this method could not have been used; it would have been impossible. Why? Because in those days when the bag came out the pains sometimes stopped; labor did not go on, and this happens now sometimes. But today we have pituitrin, and it follows in afterward and the labor proceeds and the woman is delivered. The babies do not suffer and the women do not suffer for more than a few hours. We do not intend to secure complete dilatation with the bag; we merely induce labor, and Nature produces complete dilatation and does it quickly after the bag comes out. We have used a No. 5 bag which brings us complete dilatation, but it induces such violent contractions that it is not wise in my opinion to use it unless required.

The technique of the weight is also very important. The weight must be adjusted, and I am free to say that these cases do require an unusual amount of attention but if you start the case in the morning when you are fresh and vigorous, and the case terminates in the afternoon, you have spent all the time on that case that you had to, and it is much pleasanter than spending all night and all day, as we used to do waiting for the activities of a wholly indifferent *Nature.*

I believe what I have said covers all the points, and I thank you gentlemen for your generous discussion.