

—THE—
Pittsburgh Medical Review,

A MONTHLY JOURNAL OF MEDICINE AND SURGERY.

VOL. III. }
No. 3. }

PITTSBURGH, PA., MARCH, 1889.

{ SUBSCRIPTION :
{ \$1.00 PER YEAR.

Original Articles.

A CONTRIBUTION TO THE PHYSIOLOGY AND MANAGEMENT OF THE THIRD STAGE OF LABOR.*

BY F. BLUMR, M. D., ALLEGHENY, PA.

The management of the third stage of labor has in the past few years been repeatedly the subject of active discussion by obstetricians. The behaviour of the uterus immediately after the expulsion of the child, the mechanism of the separation and the different methods of the removal of the placenta, have been studied most carefully, and the doctrine of the third stage of labor has thereby undergone essential modifications. Especially the labors of Ahlfeld,† the researches of Schroeder,‡ and his assistants, Stratz§ and Cohn,|| have thrown light upon this important question, and incited further investigations.

The methods of placental delivery which have been practised during the past thirty years and which will be considered here, are Crede's expression, the Dublin grip and the so called expectant method. Crede's procedure consists in grasping the uterus with the outspread fingers of one or both hands, and in expressing the placenta at the height of a contraction; he recommends the third or fourth contraction, which occurs about five minutes after the birth of

* Read before the Pittsburgh Obstetrical Society, February 7, 1889.

† Ahlfeld, *Berichte und Arbeiten aus Giessen*, 1883.

‡ Schroeder, *Der schwangere und kreisende Uterus*, 1886.

§ Stratz, *vide* Schroeder; *Der schwangere und kreisende Uterus*, 1886.

|| Cohn, *Zur Physiologie und Diastetik der Nachgeburt's Periode*, *Zeitschrift fuer Geburtshilfe und Gynækologie*, vol. xii,

the child, as the most advantageous and absolutely harmless period.

In the Dublin method the hands are laid upon the fundus uteri after the birth of the head, permanent contraction is insured by friction, and the placenta is quickly separated and expelled or expressed.

The expectant plan leaves the detachment of the after-birth, and its expulsion from the uterus into the lower uterine segment, cervix and vagina, to the powers of nature.

In order to estimate the value of these methods, it is necessary to consider 1st, the condition of the uterus immediately after the birth of the child, and 2d, the mechanism of the third stage of labor.

"It is strange," Cohn says, in his above quoted paper, "that an occurrence, observed in thousands and thousands of cases, has been described so differently, and yet more surprising that the real conditions are often not at all in accord with the description. Especially the behaviour of the uterus, as it can be observed through the abdominal walls, has been erroneously described. For example, Crede and Winkel state, in the *Sächsischen Hebammenlehrbuch* (1875) that, a few minutes after the expulsion of the child, the uterus can be felt as a firm ball, large as a child's head, between the umbilicus and symphysis. Litzmann (1878) gives as a sign of the separation of the placenta, that the uterus becomes smaller and harder to the touch, and the fundus descends. Really this can be observed only in exceptional cases. Ahlfeld was the first who proved by direct measurement that, in contradiction to this view, the fundus uteri is considerably higher after the detachment of the secundines."

Among French authors I mention

Cazeaux.* He says: "If the uterus is small, hard and contracted, and situated in the lowest part of the abdomen, it is infinitely probable that the placenta is, in great part at least, expelled from the cavity of the womb into the vagina. When, on the contrary, the uterine tumor continues on a level with, or even above the umbilicus, and has a soft, doughy consistency, due to its imperfect contraction, the placenta is very probably still within the womb.

The researches of Schröder-Stratz,† reveal the following:

"Immediately after the expulsion of the child, the fundus uteri is to be felt in most of the cases on a level with the umbilicus, or a few centimetres above or below.

"In thirty cases, the delivery having been terminated during deep narcosis in the horizontal dorsal position, the fundus uniformly remained at the margin of the ribs, at the same height which it had before the birth of the child.

"Also in parturient women, who have been chloroformed while the head was passing through the vulva, the fundus remained at the same height after manual extraction of the child.

"If a parturient is not in an entirely horizontal position, and the upper part of her body is but slightly elevated, the uterus, immediately after the birth of the child, slowly sinks down to the pelvic inlet, so that the fundus is on a level with the umbilicus.

"If, immediately after the delivery of the child, the hand is introduced into the uterine cavity, the thick uterine body, resting upon the flaccid lower segment, can be moved about at will; it can be elevated to the margin of the ribs, to the diaphragm, and also drawn downward to the right and left.

"According to these observations, the real normal condition appears to be that the fundus remains at the margin of the ribs and that, by its own weight, and by the effect of the abdominal pressure, it is forced downward to the pelvic inlet, because the flabby

lower uterine segment and the cervix, after being emptied, cannot hold the uterine body in its position."

I now enter upon the consideration of the course of the third stage of labor, when it is not influenced by external manipulations; I will divide the third stage of labor into three acts:

1. The separation of the placenta.
2. Its expulsion from the uterus through the contraction-ring,* and,
3. Its expulsion from the lower uterine segment, cervix and vagina.

(1) When we see how, in many cases, the placenta is separated and expelled into the vagina or through the vulva immediately after the birth of the child, or but a few minutes later, while, in other apparently similar cases, far more time is required, we cannot be surprised that the opinions held by authors widely differ, both in regard to the mechanism, and also the time at which the separation occurs.

It is beyond the limits of this paper, however, to quote and discuss the different theories of our prominent writers on the manner in which the placenta is detached. I therefore confine myself to the presentation of the view which a careful consideration of this question leads me to take, and which I believe to be most acceptable.

According to Carl Ruge's‡ investigations, a dislocation of the placenta at its placental site, on the uterine body, occurs during labor, in consequence of the uterine contractions, and very soon a loosening within the decidua serotina. The uterine contractions create, as Ruge expresses himself, from the beginning, a point of least resistance in the placenta, at which, later, the complete detachment takes place. With every contraction during labor, the contractile part of the uterine body, including the site of the placental insertion, contracts, and therefore becomes smaller but thicker. The placenta accommodates itself to the contraction of

*Cazeaux, A theoretical and practical treatise on midwifery, pages 383 and 384.

†Schröder, Der schwangere und kreisende Uterus, page 105.

*By Schröder's contraction-ring is understood the boundary line between the contractile part of the uterus, viz., the uterine body, and the lower uterine segment.

‡Carl Ruge, Die Eihuellen des in der Geburt befindlichen Uterus. Schröder, Der schwangere und kreisende Uterus.

the area of its insertion, becomes thicker; its foetal aspect shows rolls and wrinkles, but in spite of the strongest contractions, it is not separated, because it is pressed against and kept at the point of attachment with the same force with which the uterus contracts itself. (Schröder-Stratz). The consequence is, that the placental site cannot contract itself like the rest of the uterine muscle.

But immediately after the birth of the child, these conditions change; the intra-uterine pressure considerably diminishes; the first contraction, in which also the placental site now equally participates, separates, as a rule, the center of the placenta. As the contraction ceases the uterus relaxes, and the separated part of the placenta bulges out into the uterine cavity. At the same time the retro-placental space fills with blood by aspiration—the retro-placental hematoma. (Ahlfeld). The following contractions accomplish the separation.

In exceptional cases the intra-uterine pressure may diminish before the birth of the child, when the contents of the uterus are greatly reduced by rapid escape of a large quantity of amniotic fluid, or after the birth of the first twin, under which circumstances, according to our experience, premature detachment of the placenta frequently occurs. (Schröder-Stratz).

(2) The placenta, being separated from the uterine wall, and acting as a foreign body, is expelled through the contraction-ring into the lower uterine segment, cervix and vagina. By this descent the still adherent membranes are gently drawn down, and thus detached.

The placenta leaves the uterine cavity in one of two ways, either with the centre of the foetal side foremost, the membranes inverted, Schultze's mode of separation, or presenting by its inferior margin, Duncan's mode.

Matthews Duncan's doctrine, that the mode of separation described by him is the normal one, that inversion of the ovum is produced by traction upon the cord, must be considered untenable, according to the investigations of Schröder, Stratz, Cohn and

others. Cohn* observed among 500 deliveries 368 times Schultze's and 132 times Duncan's mode, the uterus in all of these cases not having been touched before the expulsion of the placenta into the lower uterine segment. Dohrn† found Duncan's mode of separation in but 20 per cent. of his cases, and this accords with my own observations. The same percentage is given by Champneys‡ in his elaborate paper, *The Mechanism of the Third Stage of Labor*, read before the Obstetrical Society of London, April, 1887.

The loss of blood during the third stage of labor, when not interfered with, is very moderate, and a normal phenomenon at this period. Cohn, who carefully weighed the blood in 101 consecutive cases, found in 85 cases of Schultze's mode of separation an average amount of 157 grammes—5½ ounces, and in 16 cases of Duncan's mode, 295 grammes—9½ ounces, in contradiction to Duncan's statement, who says, there must needs occur considerable hemorrhage when the placenta is expelled after the manner described by Schultze.

In order to investigate the manner in which the placenta is separated, several authors introduced their hands into the uterine cavity immediately after the expulsion of the foetus. I cite here two cases as published by Schröder-Stratz.§

1. P. G., 22 years, I-para.

While the cord is still pulsating, the hand is introduced into the cavity of the ovum. The placenta is still smoothly adherent to the anterior wall.

At the commencement of the first uterine contraction, the placental site is distinctly felt to thicken between the hand in the uterus, and the other, resting upon the abdomen, and the lower border of the placenta, with the membranes inserted into it, is lifted upwards. The thickening remains after the cessation of the contraction, but is less elas-

*Cohn, l. c.

†Dohrn, Transactions of the German Society for Gynecology May, 1888, Archiv. fuer Gynækologie, Vol. xxxii, page 451.

‡Champneys, Transactions of the Obstetrical Society of London, April, 1887, American Journal of Obstetrics, Vol. xx, page 661.

§Schröder, Der schwangere und kreisende Uterus. Page 99.

tic; towards the centre of the placenta a bulging is to be felt.

During the following contraction the placental surface bulges out still more, the effusion of blood becomes greater, and is forced between the membranes and the uterine wall (Fig. I). The placenta is then pushed downward from the fundus, entering with the inverted foetal side foremost, into the contraction-ring, (Schultze's mode), and is now extracted by the hand (Fig. III). The effusion of blood is completely retained by the inverted membranes. The duration of the after-birth period was fifteen minutes. Membranes complete.

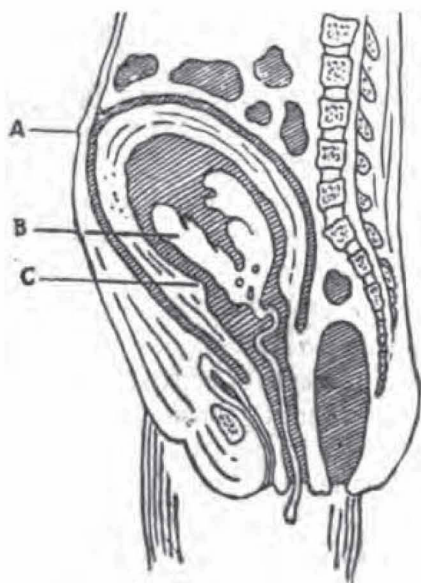


Figure I. Detachment of the placenta by Schultze's method. (After Schröder). A, Umbilicus. B, Placenta. C, Contraction-ring.

2. F. P., 20 years, I-para.

While the extraction of the child is accomplished, the hand is introduced into the cavity of the ovum. The placenta is smoothly attached for the most part to the posterior wall. Its surface bulges out irregularly under the hand during a weak contraction; especially the lower border becomes thick and considerably wrinkled.

Without the occurrence of stronger contractions, the placenta sinks down from the fundus, and slides with the lower border foremost, through the contraction-ring (Fig. II). The lower, shorter piece of the membranes now bursts, and the placenta, present-

ing by its edge, appears in the vulva. (Duncan's mode.) Extraction of the placenta. Time of the after-birth period fifteen minutes. Membranes complete.

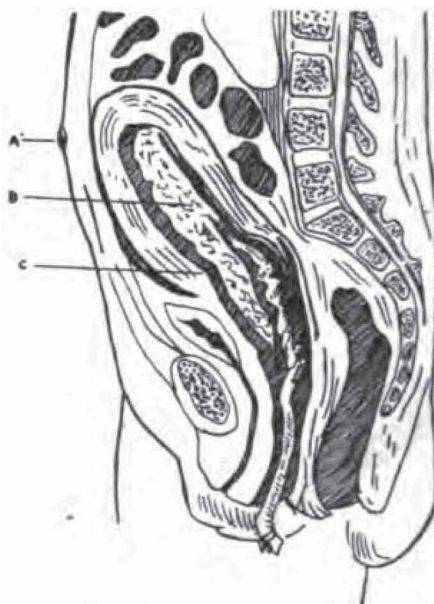


FIG. II. Detachment of the placenta by Duncan's method. (After Schröder). A, Umbilicus. B, Placenta. C, Contraction-ring.

If the placenta is detached and expelled, as described in the first case, Schultze's mode, no blood can appear externally, since it is retained on all sides by the inverted membranes. The retro-placental hematoma is found, after the birth of the secundines, in the pouch formed by the uterine side of the placenta and the membranes.

If, on the other hand, the placenta presents by its lower border, case 2, Duncan's mode, the retro-placental hematoma is pressed between the uterine wall and the membranes, the latter burst, and blood flows out before the birth of the secundines. In exceptional cases the membranes resist the pressure of the blood, and the placenta is even yet expelled after the manner described by Baudelocque and Schultze, with the foetal side foremost, and with inverted membranes. (Schröder-Stratz.)

The expulsion of the placenta through the contraction-ring, which in most of the cases is terminated fifteen minutes after the birth of the foetus, can be distinctly observed through the abdominal walls.

As stated above, the fundus uteri remains,

immediately after the delivery of the child, on a level with the umbilicus, according to Scheder-Stratz, on an average about 14 centimetres—5½ inches, above the symphysis. After the expulsion of the placenta through the contraction-ring the fundus will be found 20½ centimetres—about 8 inches, above the symphysis. The fundus therefore ascends on an average 6½ centimetres—about 2½ inches. At the same time it becomes narrower, on an average 3 centimetres—1½ inches.

"The most certain clinical symptom of the expulsion of the placenta from the uterine body is the ascension of the fundus and its diminished width, as well as the appearance of the characteristic furrow, corresponding to the contraction-ring, between the fundus uteri and the lower uterine segment, the latter being distended by the detached placenta."—Schroeder-Stratz.

The ascension of the fundus takes place gradually. It rises with every contraction, the body becomes smaller and thinner. The lower uterine segment, being collapsed after the birth of the child, becomes distended by the descent of the placenta, and pushes the uterine body upward.

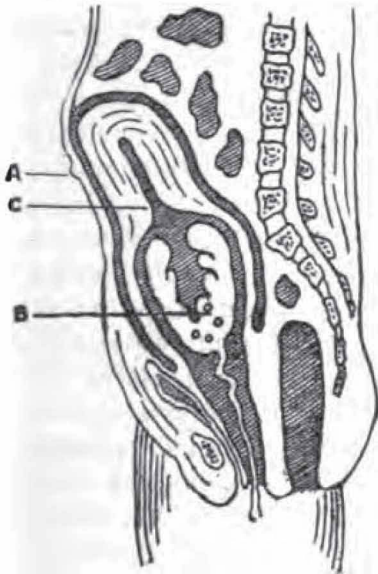


FIG. III. Placenta completely detached by Schultze's method. (After Schroeder). A, Umbilicus. B, Placenta. C, Contraction-ring.

I quote, for example, one of Cohn's* cases:
E. D., I-para.

	Height.		Breadth of the Fundus.	
	Cm.	in.	Cm.	in.
Immediately after labor	15	6	17	6.8
Five minutes "	16.5	6.6	13.5	5.4
Ten "	17	6.8	11	4.4
Fifteen "	18.5	7.4	10	4

Expression from the contraction-ring.

* Cohn, l. c.

The separation of the placenta and its expulsion into the lower uterine segment occurs, with but rare exceptions, spontaneously. When we see that, according to Cohn, in 804 deliveries, the placenta had to be separated by manual interference only four times (the consequence of adhesions due to endometritis), we are certainly entitled to assert that, pathological cases excepted, the powers of nature are amply sufficient for the detachment and expulsion of the placenta through the contraction-ring.

The placenta, with the membranes, having been expelled from the uterine body, remains in the lower segment, cervical canal and vagina, and is but in exceptional cases spontaneously driven through the vulva. The contracted uterine body has no influence upon this last act of the placental period. The expelling forces are, the abdominal pressure, the elasticity of the vagina, and the weight of the placenta itself. The contractions of the vagina are of but trifling value, the greater part of the placenta being in the lower uterine segment and cervical canal; and the weight of the placenta is, in the customary position of the parturient woman (dorsal and lateral position), of still less importance. The main factor, therefore, is the abdominal pressure, which, if it could be brought into action sufficiently, would terminate the third stage of labor. But the abdominal muscles, having been enormously distended during pregnancy, are, after the sudden evacuation of the abdominal cavity, in such a relaxed, parietic condition that they, in but few cases, are able by their contraction to effect a sufficient pressure on the placenta. These conditions are most unfavorable in the dorsal and lateral position, less unfavorable in a sitting posture.

We see, therefore, that only in a limited number of cases the third act of the after-birth period is terminated by the efforts of nature, and that, after the separation of the placenta and its expulsion into the lower uterine segment have been accomplished spontaneously, the accoucheur now is obliged to interfere in order to effect the complete

removal of the secundines from the birth-canal. What time is required, when not interfered with, is shown by the researches of Von Campe,* who found in 100 cases a mean duration of eight hours; in one case 51½ hours. Cohn justly asks whether it may still be called physiological in cases where the third stage of labor is prolonged for hours, or even for days. He tells us that in 804 deliveries the placenta has been expelled but 101 times, = 12 per cent, within the first hour, namely, 64 times spontaneously and 37 times with the aid of abdominal pressure.

The expectant method, which leaves the birth of the secundines entirely to the powers of nature, is therefore generally abandoned. When such a distinguished investigator as Ahlfeld,† in the meeting of German naturalists and physicians, held in Wiesbaden, September, 1887, recommends the expectant method, advising to give the uterus from 1½ to 2 hours time for the appearance of the "permanent contraction," when he declares every unnecessary friction over the uterus to be dangerous, and that slight contractions should be produced only when hemorrhage ensues, this certainly deserves our earnest consideration. But seeing that in 75 per cent of his cases,‡ even after two hours' waiting, manual interference was required, we cannot follow his advice.

The expectant method, even waiting for two hours only, as advocated by Ahlfeld and Winckel,§ cannot be resorted to in private practice. The majority of women become restless and anxious when the delivery of the after-birth is delayed; they believe themselves to be in danger, and cannot be quieted unless the cause of their anxiety, the tardy placenta, be removed.

Having proven that, even after prolonged waiting, the efforts of nature are, but in a small number of cases, sufficient to expel the detached placenta, which remains in the lower uterine segment, and that manual in-

terference is required to terminate the third stage of labor, we arrive at the question, How is this to be done?

The introduction of the hand into the vagina for the removal of the separated placenta should be reserved for exceptional cases, never resorted to in normal labor, the danger of infection being too great.

Traction on the cord should also not be practised. No harm will be done, however, if the placenta is delivered by drawing upon the cord at this stage, the detached after-birth resting below the contraction-ring; but it should not be recommended, as it might lead to abuse.

External manipulations, Crede's procedure and the Dublin method, have been the generally adopted practices in the last thirty years. Both methods intend to assist the efforts of nature by inciting and increasing contractions, to expedite the delivery of the placenta, and to prevent hemorrhage by securing an efficiently contracted uterus.

But the observations of Schroeder, Stratz and Cohn—and many other distinguished obstetricians agree with them—have proven that no work during the whole birth is as promptly done by the powers of nature as the separation of the placenta and its expulsion through the contraction-ring, and that no interference is needed or desirable at this stage. "Although the uterus is relaxed immediately post partum, it does not bleed yet, because no contraction has as yet detached the placenta; the uterus is still exhausted, and for a time not capable of putting forth further efforts. A few minutes of rest suffice, the uterus again contracts and terminates its last functions, the separation and expulsion of the after-birth, without massage, ergotin, etc." (Cohn.)

Neither Crede's expression nor the Dublin method assists nature, as some authors believe; both disturb a physiological process by stimulating the uterus at a time when it needs rest, and by causing an artificial separation of the placenta at a too early period.

Crede's method has been described in a variety of ways. Expression immediately after labor, expression about five minutes

* Cohn, l. c.

† Berliner Medicinische Wochenschrift, 1887, No. 43.

‡ Cohn, l. c.

§ Archiv. fuer Gynäkologie, 1888, vol. xxxii, page 456.

later, and expression fifteen to thirty minutes after the birth of the fœtus, are the rules usually given.

If we attempt to express the placenta immediately post partum, or a few minutes later, we interfere in normal cases without any reason, and this is unjustifiable. If we wait fifteen to thirty minutes, we can no longer speak of placental expression from the body of the uterus, because we compress the emptied uterine body, whilst the placenta is already below the contraction-ring.

These conditions are so simple and so easily understood that it is difficult to comprehend how some advocates of Crede's method can recommend expression fifteen to thirty minutes after the birth of the child. They say early expression is often not successful; fifteen to thirty minutes should have elapsed before the application of Crede's method is resorted to.

It is true that Crede never taught to express the placenta immediately after the end of the second stage of labor. But it is equally true that we cannot resort to Crede's procedure fifteen to thirty minutes later, for there is no placenta in the uterine body at this time in the vast majority of cases; it is already below the contraction-ring, awaiting its expulsion through the vulva, and the compression of the uterine body has, therefore, no influence upon it.

These facts fully explain why the application of Crede's method, when reserved to fifteen to thirty minutes after labor, gives better results than early expression. Those who wait do not disturb the natural process of both the separation of the placenta and its expulsion from the uterine body.

Crede* himself, who repeatedly participated in the debate on this question, admits that massage of the uterus is superfluous in those not rare cases, in which the natural forces alone are sufficient to speedily terminate the third stage of labor. Nevertheless he arrives at the conclusion that the rules given by him need not be modified.

All authors, with but few exceptions, agree

that placental expression, which Crede* gave to the profession in 1853, has been most beneficial by doing away with traction on the cord and the introduction of the hand into the birth-canal, both of which manipulations cannot be too strongly condemned. But, on the other hand, it cannot be denied that serious harm has been done by too early or too rude expression. Furthermore, Crede's method does not protect women against hemorrhage, and it is well proven that there is but a very moderate loss of blood when the detachment of the placenta is left to nature. The uterus remains more permanently contracted, there is no tendency to relaxation, the necessary thrombosis is not disturbed, and watching the womb for one or two hours after delivery is not necessary, except in very rare cases.

According to our present knowledge, neither Crede's expression nor the Dublin method, which latter interferes far more with the physiological phenomena of natural labor than the former, can be recommended for the delivery of the after-birth in normal cases. But when hemorrhage ensues, or when the efforts of nature are not sufficient to completely detach the placenta, as in some cases of Duncan's mode of separation, when the upper border of the placenta remains adherent to the uterine wall, Crede's expression is indicated.

For the removal of the separated placenta, which rests in the lower uterine segment, Cohn† recommends that the fundus uteri be gently pressed down with the hand into the pelvic inlet. "The contracted uterine body acts like the piston of a syringe, which forces all loose material before it. This method, also executed by Ahlfeld, removes the placenta with absolute certainty and great perfection" (Cohn). When the membranes do not follow immediately, they should be removed by gently drawing them downward and backward without twisting them.

This most simple procedure, which really is the last part of Crede's method, is not injurious to the patient and can be practiced without any difficulty even by midwives. It

*Crede, Die Behandlung der Nachgeburt bei regelmässigen Geburten. Archiv. fuer Gynækologie, 1888. vol. xxxii. p. 106.

*Klinische Vorträge ueber Geburtskunde, 1853.

†Cohn. l. c.

enables us to deliver the detached placenta without drawing upon the cord and without introducing our fingers into the wounded birth-canal.

During the past two years I have conducted the third stage of labor according to the above given rules, waiting till the placenta is detached and expelled through the contraction-ring,—usually fifteen or twenty minutes are required—and removing it from here by gently pressing down the fundus uteri into the pelvic inlet. The results have been most satisfactory, and I therefore recommend this expectant-active method, which combines the advantages of both the expectant plan and Crede's expression, as the most rational and best management of the after-birth period in normal labor.

The importance of the subject which I have the honor to present to you to-night, may excuse me for having gone so much into detail. The new researches of Ahlfeld, Schröder and his pupils, so interesting and practically valuable for every obstetrician, are apparently but little known in this country. While in Europe, the highest authorities, men like Ahlfeld, Dohrn, Freund, Schröder and Winckel recommend the expectant-active method, designating it as the method of the future, as the procedure which gives the best results, our latest great American works on obstetrics do not even mention it.

When Crede first published his procedure in 1853, two different methods of the management of the third stage of labor were in vogue, the active and the expectant. The followers of the active plan removed the after-birth soon after the expulsion of the child by internal manipulations, while the defenders of the expectant method left the delivery of the secundines entirely to nature. The application of external manipulations, practiced as Engelmann* tells us, by primitive people at all times, from the day of the ancient Hebrews and Arabs to that of the North American Indians, was completely lost. Today the situation is a similar one. Again two

methods of placental delivery are under consideration: Crede's expression and the expectant-active plan, both of which are so thoroughly discussed by distinguished accoucheurs, that every experienced obstetrician can form his opinion.

I refer those who desire more detailed information to my above-cited authorities, especially to the works of Schröder, Stratz and Cohn, from which I have drawn freely.

*Geo. F. Engelmann, M. D.: *Massage and expression in the obstetric practice of primitive people. American Journal of Obstetrics*, 1882, Vol. xv, p. 601.