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THE CÆSAREAN SECTION IN PLACENTA PRÆVIA.

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Although Sänger's improved Cæsarean section has shown a lessening mortality, year by year, in the hands of certain experienced operators, this invaluable acquisition of obstetrical art is still a grave procedure, especially as it involves an attempt to secure primary union in tissues undergoing retrograde nutritive processes, and is performed under the conditions of impaired re-activity against wounds which pertain to the parturient state. These are constant factors in the result of the operation, peculiar to it, and absent from other laparotomies.

The Cæsarean section is indicated, in general, where other modes of delivery have been found impracticable, or would plainly prove so, and when its risks, dreaded as they are, still fall below those obtaining or certain to accrue.

But there is, I believe, another category in which we should resort to this operation, viz.: where a healthy fœtus is necessarily sacrificed or subjected to inordinate degrees of risk, in order that a maternal life may not be equally endangered, as exemplified in standard modes of treating placenta prævia. I hope to substantiate this proposition by the following comparison of the different methods of treating placenta prævia with the results of a Cæsarean section, to be reasonably anticipated at this time, and also to demonstrate that the dangers of a Cæsarean section, if advantage be taken of the progress which has been made in the definite and timely recognition of its indications, as well as in its technique, are, in reality, very considerably less than those of the graver forms of placenta prævia, under any of the usual or known modes of treatment.

But, as a preliminary to a consideration of these points, I desire to comment briefly upon the ethical relationship of the maternal and fœtal lives. This subject, a matter of controversy from time almost imme-

morial, has been ardently discussed within the last five or six years, in England and in this country, by Tait, Hicks, Barnes, Meadows, Lusk, Montgomery, Boisliniere, Busey, Wathen and others. While my own views are mostly similar to those of Meadows or Lusk, I think we should endeavor to define yet more strictly the extent of maternal obligation to the fœtus, while duly estimating the respective rights of mother and child. The importance of the subject, and its immediate relevancy to the subject of this paper, must serve as my excuses, should I repeat what has been so well and forcibly said by others.

The specific object of the generative function is the perpetuation of the species; this is its sole purpose, however it may be dominated by psychical influences throughout the animal kingdom. In man, the exercise of this function involves both parents in a common responsibility to their offspring, and also in reciprocal responsibilities to each other. The sexual act must be regarded as a natural compact, all ecclesiastical and social laws governing marriage being founded upon its obligations. This subjacent responsibility of both parents, even irrespectively of declared marriage, is recognized by common and statutory law in every civilized community, and must be held to be incurred at the time of the sexual act, however thoughtlessly this act may be performed. If fecundation results, a natural obligation becomes imposed upon the male of supporting and caring for the mother and her offspring during pregnancy, lactation and the adolescence of the child.

By the female, an obligation is incurred to nourish the embryo, to protect it during its uterine development, to bring it forth and to suckle it from her own breasts, and to care for it physically and psychically until it becomes mature. These obligations are universally recognized by conscientious women.

By a converse interpretation of the sexual compact, the mother binds herself, moreover, not to do anything which may contravene the development or imperil the life of her infant, unless such an act is indispensable to her own physical safety.

The fœtus, called into existence by the voluntary act of its parents, from the moment of fecundation, is potentially a human being, endowed by nature and by the laws of all countries with the fundamental rights of the species. Even during the term of intra-uterine life, the fœtus has its rights, some of which are proper to itself as a member of the human family, and others complemental to the obligations of the mother towards it. These rights, so ably vindicated by the lamented Meadows, are a right to protection and nurture while *in utero*, and an inherent right to live, subject to no qualification except that of imminent jeopardy to the life of the parent organism.

The term *viability* has been obviously misused; a healthy fœtus is viable from the moment of conception. Before it is able to live apart from its mother, the fœtus, or embryo, is in the highest sense alive and

capable of living, being perfectly adapted to the condition of its existence; it is viable if *not separated* from the mother; after the end of the sixth month, it is frequently viable *if separated from its mother*. Year by year, this fœtal life is becoming more respected, nor can any special stage of its existence be assigned at which it becomes either more or less sacred; during every stage of pregnancy it is respected by the criminal law. During pregnancy, therefore, the mother has under her keeping the interests of a life for which she is responsible under her own voluntary contract, and even in pregnancy after rape, where it might be alleged that no sexual compact had been entered into, the rights of the fœtus remain unaffected, inasmuch as it has an inherent right to its life, and cannot live if protection during its intra-uterine sojourn or nourishment afterwards from the breasts of its mother be denied it.

On the other hand, also, the rights of the pregnant mother must be duly considered and equitably weighed. The fœtus has a right to live, but so has the mother. The fœtus has a right to development and extrusion at term with the least possible danger to its existence. The mother, conversely, has a right to all the immunity from danger compatible with the hazards of pregnancy and parturition, dangers to which she has willfully submitted herself. She then always undertakes a certain degree of risk, well known to women, and, in abnormal conditions, must be prepared to encounter still graver degrees of danger.

The safest basis upon which to found a principle of obligation, where risks greater than those of normal pregnancy and labor must be submitted to by the mother, is, I believe, the altruistic law which exacts that the life and interests of another are to be held *equal* to our own. We are not required by any law, as Dr. Paley observes, to have our neighbor *better* than ourselves, but *as* ourselves. Hence, even in pregnancy after rape, the mother would not be authorized to jeopardize the life of her fœtus, but must bring it to term, and would be obligated to participate equally with it in the risks of delivery. How much the more, therefore, will she be bound to participation in such risks when the pregnancy is the sequel of a voluntary sexual act, in marriage or out of it?

It is not just that a woman should elude the dangers of the pregnant or parturient condition by fastening them upon her fœtus; she is bound to participate in them *equally at least*. She must not expect to secure her own safety by measures involving the death of her offspring at any stage of pregnancy, unless her own life is distinctly and unmistakably imperiled; nor is the fœtus entitled to immunity from danger at the expense of a greater risk to the mother than to itself. The mother, I hold, undertakes these risks by the sexual compact; if greater risks than usual are to be encountered, she must be held to the spirit of that compact and share them with her offspring; the risks must be *equally divided* between the two lives. Upon this basis obstetrical advice and

action should rest, unless the mother desires to submit herself to greater risks than those affecting her child, from religious or other motives. The obstetrician should hold himself equally the guardian of the mother and of the fœtus; he is responsible to his art, to his own conscience and to the law.

It has not yet been practicable to deduce a rule of conduct from any comparative estimate of the value of fœtal and maternal lives. A life is for itself. While that of the mother is undeniably the most valuable as far as any immediate and cotemporary relation with its surroundings is concerned, the life of the child, even yet unborn, may be prospectively of far greater importance than that of its parent, or may become so after a period of development so brief as to be practically cotemporaneous in the progress of society. I believe that this prospective value of a child's life, amid the accumulating advantages and wonderful activities of our times, is quite equal to that of its parent, already more or less spent. Such, without doubt, is the estimate placed upon the lives of the young by Nature, for she has ordained them the heirs of all their predecessors, destined to utilize and administer what the race has accumulated. It is impossible, moreover, to weigh one life against another, for each life is essentially incommensurate with every other. When, therefore, conditions arise which endanger the mother, immediately or prospectively, it is our duty to make a careful estimate of the special degrees of risk pertaining to each of the subjects involved. If, in the early months, the continuance of a pregnancy subject a woman to immediate hazard, it will be undoubtedly proper to terminate it artificially, especially as, at that time, the fate of the fœtus is indissolubly linked with that of its parent. So, likewise, after the fœtus becomes capable of an independent existence, if similar conditions obtain, we are thoroughly justified in inducing premature labor. We derive our authority from the consideration that the whole burden of danger should not be borne by the mother; the life of the fœtus is not to be preserved at the probable expense of that of its mother, even were its own existence assured under such circumstances, which is by no means always the case.

Hence, in the severer forms of cardiac disease, of pulmonary œdema, in Bright's disease, œdema of the vulva, pelvic effusion, retroflexion of the gravid womb, placenta prævia, and many other conditions, it has been justly held proper to induce premature labor. The fœtus must be subjected to the risks of a premature birth in order that the mother may not perish at a subsequent period, its own existence being at the same time greatly endangered. According to this rule, also, labor should be induced whenever the mother is reasonably supposed to be incapable of living through the natural period of her pregnancy, as after a first severe hemorrhage of a placenta prævia. In certain cases we are justified in inducing a labor prematurely in the interests of the

child, as where the head has been found abnormally large in a previous labor, or the cranial bones unduly ossified, or where the fœtus has habitually died in the last weeks of pregnancy, unless this be due to syphilis (Cameron). This consideration also holds good as a plea for premature induction of labor in placenta prævia, for the child is apt to die by exhaustion from the repeated maternal hemorrhages before labor sets in or the full term of pregnancy is reached. Here we subject the fœtus to the risks of premature birth rather than allow it to be submitted to still greater prospective dangers.

In cases where delivery by the natural route is known to be impossible at term, as in contracted pelvis, pelvic tumors, or carcinoma of the vagina or uterus, it is recognized by all authorities as proper to induce abortion or premature labor at a time when the fœtal body, dead or alive, is capable of passing through the natural passages. This is our only resource, if the child is to be born alive, unless we allow the pregnancy to advance to term and deliver by the Cæsarean section, or remove an obstructing tumor during pregnancy. The choice of methods will be directly controlled by the special views held by the operator, or the desire and religious tenets of the patient and her friends. Under the principle of maternal obligation and fœtal rights, such cases should, if possible, be allowed to go on to term, when a Cæsarean section should be performed. In contracted pelvis, between two and three-fourths to three inches of conjugata vera, there is a moderate risk to the mother and a fair chance of saving the child by the induction of premature labor, according to Schroeder's measurements, not later than the middle of the seventh month. But with a conjugate of less than two and three-fourths inches, the child's chances are so slight as not to be worthy of consideration. "In these degrees of contraction," says Lusk (1892), "the time is probably not far distant when it will be possible to substitute the Cæsarean section for craniotomy." Within a few months past, Barbour has allowed a case in contracted pelvis to go to term, and delivered by the Cæsarean section, saving both mother and child. This method of delivery has also been substituted for the induction of labor, in ten cases of eclampsia with rigid os, as proposed by Halbertsma, in Holland, the mother and child having been saved in eighty-five per cent. of the cases. Such a result could never have been attained by the slow and irritating procedures involved in the induction of labor.

I do not believe that, in the various methods of treatment of placenta prævia, the interest of the child have been properly respected, the rules of practice having been fallaciously based upon a comparative valuation of the two lives, and not upon those equitable principles of maternal responsibility and division of the risks which ought to govern our conduct. This I shall endeavor to show, and, still further, that a Cæsarean section, in the graver forms of placenta prævia, would enable us to save a large percentage of children, not only without enhancement,

but with a notable diminution of the maternal risk. No obstetrical condition can be conceived of, more utterly abnormal, than an engraftment of the placenta upon the lower uterine segment. Such an insertion irretrievably deranges all the processes of physiological labor, not only invalidating those mechanisms by which safety is assured to both mother and child, but actually intensifying all the perils normally guarded against, and, moreover, introducing special elements of danger peculiar to itself.

The following contrasts have been framed to illustrate these statements:

First.—When the placenta is inserted into the upper zones of the womb, the development of the uterine sinuses and arterial vessels is accomplished in the midst of well-developed muscular structures, capable of prompt and firm retraction after labor. When, on the other hand, the placenta is inserted upon the lower segment, the uterine sinuses, even more extensively spread out in consequence of the greater lateral growth of the placenta, must be developed in the substance of a thin wall, capable of but sluggish retraction after labor, which they still further thin and weaken.

Second.—In a normal insertion of the placenta, the uterine sinuses are gradually closed as parturition advances, by the retraction of the uterine fibres. In placenta prævia, these sinuses are stretched and dilated, possibly torn, by the pressure of the presenting part and efforts of the superior zones to effect that cylindrical expansion of the lower zone, which is indispensable for the passage of the fœtus.

Third.—Normally, as labor advances, the lobules of the placenta are approximated to each other, while in placenta prævia they become more and more separated, with consequent danger of rupture of chorionic tufts, or at least impairment of the placental circulation by tension.

Fourth.—The intra-uterine pressure is normally exerted upon the placenta only during uterine contraction; in placenta prævia it is exerted likewise during the periods of uterine relaxation, for the presenting part remains more or less *in situ* and thus keeps up a dangerous degree of pressure even in the intervals between the pains; there is, hence, a continual, if not strictly uniform, interference with the fœtal circulation pressure upon the placenta.

Fifth.—During the latter months of pregnancy the growth of the placenta coincides with that of the womb and its vascular connections are seldom disturbed; in placenta prævia the change of shape of the lower zone, characteristic of advanced pregnancy, necessarily disturbs the vascular communications between the uterus and the placenta, and hemorrhage must ensue, proportioned in gravity and in the time of its appearance to the degree of this disturbance.

Sixth.—Normally there is no hemorrhage until the placenta is detached and no progressive detachment of this organ during the stage of

dilatation and expulsion. In placenta prævia the placenta is *progressively* detached during the expansion of the lower uterine segment, *pari passu* with the dilatation of the cervix and contraction of the superior zones, the torn or half-torn vessels being kept patulous by the stretching of the tissues through which they pass, not only during a pain, but also during the intervals of uterine contraction. Hemorrhage must, therefore, qualify the very commencement of labor, must continue during the dilatation of the cervix, and persist, as Müller and Kuhn affirm, even *during the pains.*[1]

Seventh.—After normal labor, uterine hemorrhage ceases, for the general retraction of the uterus diminishes the blood supply and constringes the open sinuses, allowing an œdemic clotting to occur, while the clots in the mouth of the vessels are firmly compressed and held in position by the tonicity of the organ. In placenta prævia, on the other hand, hemorrhage may continue after labor, for the retractility of the lower zone is far inferior to that of the superior zones, and the torn orifices are not properly closed. Thrombosis, therefore, is the principal factor in the arrest of post-partum hemorrhage after placenta prævia, but this process is by no means as effective or as prompt as under normal conditions, for the retractility of the placental site is defective, the open vascular mouths are more gaping, the clots already formed are not firmly clamped by tonic contraction of the womb. The bleeding vessels, moreover, are nearer their primary source than when the placenta is attached high, since the uterine arteries are distributed upon the womb near the level of the inner os and most voluminously to the lower segment of the womb, whose higher vascularity is well known to the hysterotomist.

Eighth.—In consequence of the insertion of the placenta upon the lower uterine segment, the fœtus is developed during the later months in a more or less abnormal position, very commonly transverse or with the breech or head resting on one of the iliac fossæ. This results in a stretching and thinning of the lower zone and emphasizes all the dangers of an insertion of the placenta upon it.

Ninth.—Normally the cord is rarely prolapsed, unless it be unusually long or the presenting part of the fœtus fill the inlet too loosely, occurring once in about 230 cases. In placenta prævia, prolapse of the cord is common, because the placenta is attached low in the womb and lateral presentations of the fœtus occur in from twenty-five to thirty-two per cent. of the cases. The cord, moreover, is often attached to the margin of the placenta or to a vilamentous membrane.

Tenth.—In placenta prævia the pains are apt to be slow and ineffective during the early period of labor, in consequence of the shielding of the lower segment of the womb and uterine surfaces near the inner os from direct contact with the presenting part by the interposed pla-

1. Lusk, 1892.

centa. These parts are supplied with nerves of cerebro-spinal origin, and are areas of excitement in a circle of reflex action, through the sympathetic, upon the superior zones, and probably also of inhibition of the circular fibres of the lower zone itself. The lower zone therefore is not only mechanically prevented from dilating by the adhesion of the placenta in varying degrees, but also by the uninhibited contraction of the circular muscles. This sluggishness of the cervix prolongs the period of hemorrhage. (See discussion of Duncan, Hicks, Champneys *et al.*, Obst. Soc. of London, in *London Lancet*, Am. Ed., p. 58, for July, 1886.)

Eleventh.—In placenta prævia, the lower zone of the uterus is weakened, and the tissues adjacent to the cervix as well as of the cervix itself are highly vascular and softened, in eighty-eight per cent. of the cases the vaginal portion being characteristically swollen and voluminous. These conditions predispose to rupture of the cervix and lower portions of the uterus, as Barnes has so fully explained. Placenta prævia is mentioned by Bache Emmet in the American Society of Obstetrics and Gynecology as a predisposing cause of laceration of the cervix. Placenta prævia, moreover, is a condition which is universally treated by manipulations upon or through the os with forceps, dilating appliances and the hand, often when dilatation is as yet incomplete and under the pressure of dangerous and uncontrollable hemorrhage. Laceration under such circumstances must be very frequent, and by the ancient method of the *accouchement force* was probably almost universal.

Twelfth.—After normal labor, the uterus contracts firmly, expels clots, and does not permit the retention or stagnation of the lochial discharge, the thrombosed placental site lies high and is well drained; but after placenta prævia, the lower uterine zone does not retract well, oozing of blood continues, the lochial discharge accumulates upon the placental region, which is in the lower part of the womb, is not expelled, stagnates, readily putrifies, and communicates a septic movement to the clots which fill the vascular orifices. The contusions and lacerations inevitable during the extraction of the fœtus through such abnormal parts, by subsequently becoming the seat of inflammatory processes, still further predispose to the reception of septic impressions. Hence, after placenta prævia, septic affections are far more frequent than after normal labors, occurring, according to Müller, in one-fourth of the cases, with a mortality of over sixty-eight per cent. of patients so affected.

Thirteenth.—Normally, the placenta is easily detachable from the uterine wall. In placenta prævia, in consequence of the deficient thickness of the uterine mucosa in the lower segment and neighborhood of the os internum, the placental villi grow less vigorously at that region, the placenta is diffusely and irregularly developed, and is not as

readily separable from the uterus as when normally located. Hence, adhesions frequently exist, and were found by Müller in fifty-six cases out of 142. or nearly forty per cent. In a recent case I found the placenta strongly adherent, although finally detachable without requiring the passage of the fingers into the uterine cavity.

The essential features of placenta prævia, therefore, are exhausting and repeated hemorrhages during pregnancy, which may readily prove fatal, hemorrhage during and after delivery, lacerations of the cervix and lower uterine segment, irregular presentations, prolapse of the cord and a marked proneness during the puerperium to septic affections, especially those of the phlebitic or pyæmic variety. All these conditions are referable to the abnormal implantation of the placenta and its effects upon the development of the womb, the presentation of the fœtus, and the phenomena of labor and the lying-in period.

The statistics which I have at hand showing the gravity of the affection are briefly as follows:

Among the authorities quoted by Hodge in 1866, Robert Lee estimated the fatality to the mother at 33 per cent., and to the child at about 66 per cent. Trask reported 27 per cent. of mothers lost out of 236 cases artifically delivered.

As regards the child, Hodge rather quaintly observes, "Reports are less satisfactory, the result not being usually stated."

"If the cases are left to nature," says Playfair, "the maternal mortality would doubtless reach 22 per cent." Churchill estimates the mortality at 1 in 3 cases. Spiegelberg estimates it, including deaths from puerperal disease, at 30 per cent (Parvin). Müller concludes that the mortality, inclusive of deaths from sepsis, is not less than from 36 to 40 per cent. The gravity of the prognosis is materially affected by the variety of the placental insertion. According to Lusk, the mortality is twice as great in placenta prævia centralis as in the lateral form. This is an under-estimate. Depaul lost 14 cases out of 25 of central insertion, or 56 per cent.; out of 31 cases of partial implantation he lost 3, while in 15 cases of the lateral form he saved all the mothers. Hecker out of 42 cases, 29 lateral, 11 marginal, and 2 central or total, lost 7 cases, viz.: 16.7 per cent (Parvin).

The fœtal mortality is appalling. Nearly 2 out of 3 children, says Lusk, are born dead, and more than half of those born living die within ten days. Parvin states that the fœtal mortality rarely falls under 50 per cent., and in some statistics rises to 70 or 75 per cent., or even higher. Spiegelberg estimated it as somewhat over 50 per cent. Barnes put it at 64 per cent.; Schwartz at 75 per cent.; Hofmeier at 63 der cent; Behm at 83.4 per cent. These variations are somewhat attributable to the methods of treatment adopted. According to Playfair, asphyxia from the loss of menstrual blood and from the impairment of fœtal hæmatosis by detachment of the placenta in varying degrees, prematurity, and malpresentation, are the main causes of fœtal death.

The maternal mortality, as averaged from Playfair's and subsequent statistics, for all cases, treated or not, may be thus stated as 29.6 per cent.; Spiegelberg's figure is 30 per cent. For the fœtus, the average mortality would be about 55 per cent., also nearly Spiegelberg's estimate.

Let us inquire how this average mortality is affected by the standard methods of treatment. Of these, there are mainly *three*, characteristically different in principle, viz.: Braxton Hicks' method by turning and slow extraction; Barnes' method by detachment of the placenta and subsequent version or use of the forceps, and the tamponade. Other varieties of treatment, such as Murphy's, Jungbluth's, Lomer's, or the intra-uterine employment of the tampon are essentially based upon these, and vary only in the time and manner of employing their special features. Hicks' method has been endorsed by Zweifel and Kaltenbach, and extensively tested by Hofmeier. It was analyzed in a report by Lomer, published in this country in 1884. It consists essentially in turning by the combined method which Hicks first proposed, perforating the membrane as far laterally as possible, bringing down one foot or a knee, and extracting slowly, no more pressure being exerted upon the cervix than will suffice to control the hemorrhage—the weight of the arm, says Hicks, will be usually sufficient. Zweifel cites a case of total implantation, where he avoided perforation of the placenta, by placing the woman upon her side, so as to allow the fingers to pass anteriorly above the symphysis pubis, and so more easily attain the membranes. (Parvin.)

The maternal mortality by the method of Hicks, which is a sort of premature version, as Lusk styles it, inasmuch as the version is effected before the os is fully dilated, in the hands of Hofmeier, Behm and Lomer, with other operators, altogether eleven in number, and in 178 cases of all degrees of gravity, was 4.5 per cent. Lusk does not state whether this report includes deaths by sepsis. Hofmeier in 37 cases lost only one, and Behm did not have a single death in 40 cases. Behm's fœtal mortality, however, was 83.4 per cent.; Hofmeier's 67 per cent. In 1884, Lomer reported 101 cases in the practice of nine assistants, in the University Hospital for Women, of Berlin, with seven maternal deaths, and a fœtal mortality of 50 per cent. (Lusk, 1892.)

Barnes' method is based upon his discovery that digital separation of the placenta allows the cervix to retract to some extent, and arrests the hemorrhage temporarily, probably by severing totally all stretched, half-torn and gaping vessels, no doubt also, in part, by the partial retraction of the cervix which attends the manœuvre. He sweeps the finger around, detaching the placenta as far as possible, tears the membranes freely, and establishes the presentation of the fœtus before withdrawing the hand. "If," says Barnes, "under the pressure of a firm binder, ergot or stimulant, the cervix being now liberated, uterine action is established so as to drive the head down, it is pretty certain

there will be no more hemorrhage. The case may be left to nature, and may be regarded as freed from the placental complication." (Parvin.)

Barnes' maternal mortality was 9 per cent., his fœtal mortality was 64 per cent.

Cohen's and Davis' methods may be regarded as variations of Barnes' method without any decided advantage. An earlier descent of the presenting part may thus, perhaps, be secured, with diminution or arrest of the hemorrhage as soon as the lower uterine segment is sufficiently dilated to permit the passage of the fœtus.

Vaginal tamponade, as employed by Wigand, Tarnier and Pajot, is now mostly disused. The tampon is utilized as a temporary expedient only. It is allowed to remain three or four hours and is then removed, and the vagina washed out with an antiseptic solution. The further conduct of the case is by rupture of the membranes, if the cervix is found moderately dilated, by Barnes' placental detachment with ergot, etc., or by Hicks' method of version, or even, if need be, by internal podalic version, as soon as the hand can be passed into the uterus. The tampon will cause pronounced uterine contraction, will induce dilatation of the cervix, and arrest hemorrhage. It need not be feared as favoring concealed hemorrhage or septic infection if properly applied. The tampon is regarded as a particularly valuable resource in cases of profuse hemorrhage with undilatable os, which are much more frequent than has been generally stated. Wigand and Depaul allowed the tampon to remain as long as twelve to twenty-four hours, and renewed it if necessary. Pajot and Bailly waited for the expulsion of the tampon in advance of the child. Müller defines the use of the tampon as an important temporary measure, inductive of labor and of softening and dilatation of the os; to be used where the os is rigid and but slightly opened, if there is violent hemorrhage. The tampon lessens the bleeding, if it does not arrest it, and prepares the parts for labor. According to Auvard's statistics, when the tampon was used, presumably as a principal method, the maternal mortality was 6 per cent., and the fœtal 55 per cent.

Jungbluth's method of packing the cervix with abtruncated sponge tents is for the double purpose of dilatation and arrest of hemorrhage; being a mode of cervical tamponade. He never employs the vaginal tampon, but if bleeding becomes obvious at the vulva, which is covered with a pad, additional tents must be inserted into the cervical opening, or the whole series re-adjusted. More tents must also be introduced as the cervix dilates. After due preparation of the cervix, the membranes should be ruptured, and, if the head present, the case may be left to nature, or the forceps applied. Where, however, the head is movable, hemorrhage persistent and patient anæmic, version should be preferred, says Lusk in detailing this method, as furnishing the more rapid mode of delivery.

A method of treatment was described some years ago by Manghi, of this city, which he employed successfully; a similar method has since been practiced by Engelmann. Its essential feature is the introduction of a sponge through the cervix, as soon as this is sufficiently dilated, impregnated with perchloride of iron in moderate strength. The vaginal tampon is previously employed if the os be insufficiently dilated, or may be used concurrently with the intra-uterine tamponade. Strips of iodoform gauze are well packed into the os, and with moderate firmness into the vagina. The packing is renewed daily, or until labor begins. If the head present, the case is left to nature as much as possible. If the presentation is lateral, an effort must be made to cause the head to present, by Hicks' method of cephalic version.

In placenta prævia hemorrhage rarely occurs before the seventh month, but so irritating is this condition to the womb that only a small minority, Müller says one-third, of the cases ever reach maturity. Natural action, therefore, in this case, as in so many others in surgery and obstetrics, points to the proper method of treatment. This is, unquestionably, evacuation of the uterus as soon as the diagnosis is established, or at least after the first hemorrhage. Temporizing is altogether inadmissible, unless extraordinary precautions be observed and efficient preparations made in cases of the recurrence of hemorrhage. Hence placenta prævia should always be treated prophylactically in the graver forms. In the lateral form, hemorrhage, as a rule, occurs late, or not until term. It is the total, partial and marginal forms which bleed early. Placenta prævia, therefore, is grave in proportion to the earliness of the hemorrhage. Zweifel states that, in the total variety, the hemorrhage first occurs from the early part of the seventh month to the last week of the eighth month; but in the lateral, after the beginning of the eighth month. It is the lateral forms, mostly, which go on to term. Parvin describes Murphy's method of premature delivery in these cases. Following Barnes, Murphy passes a finger into the os, which he says he has always been able to do, and separates the placenta all around. He next dilates carefully with Barnes' bags, and, when the cervix is fully dilated, he gives ergot freely and then decides what next to do. If the placental attachment is lateral or marginal, he ruptures the membranes, if the pains are fairly strong, and leaves the case to nature; or, if the head be well engaged, applies the forceps. In the majority of cases, however, he delivers as quickly as possible, preferably by Hicks' method of version. Murphy, in 15 cases, succeeded in saving all the mothers, but with a mortality of 57 per cent. of the children. Thomas, who has been one of the earliest advocates in this country of the prophylactic treatment of placenta prævia by the induction of premature labor, has reported 11 cases with 2 deaths, over 18 per cent. Hecker lost 3 cases in 40; Hoffman, 2 in 30 and Spiegelberg 16 per cent., including deaths by sepsis. (Lusk.)

It has not been considered *important to mention fœtal mortality* in these latter statements. I followed Murphy's method (1890) in a case of marginal implantation. The mother was saved, recovery ensuing without noticeable rise of temperature or subsequent hemorrhage. The child was born dead. The shoulders presented; the cervix was easily dilatable by Barnes' bags; the membranes were ruptured after cephalic version. As the hemorrhage had ceased, the case was left to nature, ergot in free doses, as Murphy advises, being administered. Delivery in two and a half hours after rupturing the membranes. The placenta was decidedly adherent, but was delivered by taking a turn of the cord around the thumb, in contact with the placenta, which was firmly grasped betwen the thumb and two fingers of the same hand. Traction in the proper direction was then made, in combination with uterine compression above. Traction *upon the cord downward and backward* is advocated by Lusk; Speigelberg advises the thumb in the vagina, to be used as a pulley, after the manner described. The pregnancy had advanced to the middle of the eighth month; there had been only one very severe hemorrhage twenty-four hours before delivery.

The tamponade of the vagina, or of the cervix, as a preparatory measure, with prompt extraction, after full dilatation of the os, unquestionably gives the best results for both mother and child. The method of Hicks, by slow extraction, saves most mothers, but is most disastrous to the child, *whose body is utilized as a tampon*, to repress hemorrhage by compression of its own placenta. Indeed, the life of the child is regarded by those who advocate and practice this method as of altogether secondary consequence.

Although Barnes, by his method of digital detachment of the placenta, claims to save more maternal lives than by most other plans, still by his own statement 9 per cent. of mothers perish; a low rate, if compared with the general average of all cases, which we have seen to be nearly 30 per cent., but still a fearful death-rate, undoubtedly higher than either Hicks', Hofmeier's, that of the Berlin percentages, or by Murphy's method. Barnes loses 66 per cent of the children. This is 11 per cent. higher than the general average and 16 per cent. above that of Speigelberg. The methods adopted under both Barnes and Hicks' systems, are, undoubtedly, effective as regards the safety of the mother, but this result is obtained only by a sacrifice of the child. In England, and, unfortunately, by too many practitioners in this country, the life of the mother is regarded as of paramount importance; at least in the existing inadequacy of the treatment, and from the fact that the causes of most danger occur before the maturity of the child, practitioners are compelled to act as if the life of the fœtus were of minor importance, whatever their theoretical opinions might be.

By Hicks' method of version and slow extraction, the pressure of the engaging parts of the fœtus upon the placenta cannot fail to result

disastrously to the child. In Barnes' method, a similar slow extraction is often practiced, either by forceps or version, or the fœtus is left to the action of the natural forces, if the head presents and the hemorrhage is not urgent. It is obvious, however, that a digital detachment of the placenta must aggravate the prognosis for the fœtus, in a degree strictly proportionate to the extent of the artificial detachment, while, furthermore, during the subsequent dilatation of the cervix and engagement of the fœtus, those portions of the placenta still attached are subjected to pressure, a condition which, although fully recognized as in direct contravention to the necessities of fœtal life, is purposely utilized for the control of hemorrhage, in the interests of the mother.

A similar objection holds against the tampon, whether used in the vagina, in the cervix, or between the placenta and the margin of the os. The pressure of the presenting part of the fœtus against its own placenta is desired and effected for the same purposes, during the process of cervical dilatation and canalization of the lower uterine segment.

If, on the other hand, the fœtus be *rapidly extracted*, before the os is well dilated, trusting to the usual, but by no means constant, softness and dilatability of the cervix in placenta prævia, in the hope of saving the fœtus when viable, or in view of urgent hemorrhage, as was advised by Speigelberg, and well illustrated in Coe's case (cited further on), the maternal mortality, in consequence of the violence employed, attains a high figure, 16 per cent. of all cases, while only one-half of the children are saved.

In contemplating these modes of treatment and the statistics which attach to them, individually and collectively, their unsatisfactory character becomes evident, in spite of the immense study, under most favorable circumstances, and by the best operators, which has been made of this terrible abnormality.

Placenta prævia is the *opprobrium of obstetric art*; its treatment is a Gordian knot which assuredly *has not been untied*, and most probably will never be as long as it is sought to extract the child, in the graver forms of the affection, through the natural passages. *Slow extraction is fatal to the fœtus, rapid extraction to the mother*; anything like expectancy is fatal to 30 per cent. of the mothers, and to 55 per cent. of the children, at the lowest estimate.

Hemorrhage during the later months of pregnancy is unavoidable, being due to the expansion of the lower uterine segment by a natural process, but the canalization of this portion of the womb and dilatation of the cervix *in labor* is the essential element of danger. A woman seldom dies of a first bleeding, but usually succumbs to repeated hemorrhages, especially to the hemorrhage attendant upon labor, or perishes afterwards by sepsis, directly due to injuries and manipulations of the parturient canal, mostly affecting the cervix and its neighborhood. *The canalization of the uterus* in placenta prævia is the cause of the contin-

ued hemorrhage, the asphyxia of the fœtus, and directly or remotely of traumatism. The stretching and atony of the placental site is a prime factor in the eventual septic infection. All methods of extraction *per vias naturales* must gravely complicate the prevailing conditions, aggravate existing dangers, and predispose to subsequent ones. It is perfectly true that by the recognized methods of treatment a great number of women have been saved, who would surely have perished without aid, but the statistics do not show that the corresponding fœtal mortality has been simultaneously reduced below the average of expectancy. On the contrary, the method of version with slow extraction gives a fœtal mortality much higher than the general average, and so likewise does that of Barnes, as two-thirds of the cases of placenta prævia demand our attention before term, an element of prematurity is necessarily introduced as one of the causes of fœtal death; but the fœtal mortality in placenta prævia is far higher, at the same stage of pregnancy, than has been observed in the induction of labor for conditions involving the maternal organism alone. In 45 cases reported by Leopold and his assistants, tabulated from the Dresden clinics, there was a mortality of only one-third of the children (Cameron, of Montreal). With high grades of pelvic contraction the fœtal mortality must of course be very great, owing to immaturity, but if we compare the results of induced premature labor in women who have been able to bear living children at term, although affected with contracted pelvis, with the results of such deliveries at term in the same women, as Dohrn has done, we find some remarkable results. Dohrn reports 25 such premature labors, with 15 living children. Küwne and Berthold, 18 induced labors, under the same category, with 13 living children. Milne likewise induced premature labor, under the conditions above stated, in 38 cases, with 35 children born alive (Lusk, p. 501). This gives us what we may regard as the normal average of fœtal mortality in induced premature labor, viz: 22.2 per cent., the fœtus, however, is always subjected to risks inherent in the methods by which labor is induced.

By the mere fact therefore of *prematurity*, the mortality should not exceed 22.2 per cent. for cases occurring at various times during the last two months of pregnancy. The mortality of children born in placenta prævia, mostly during the same period of pregnancy is at least 55 per cent. as a general average of all treatments and of expectancy,—while by Hicks' or Barnes' methods this mortality rises to 67 or even 83.4 per cent. The methods of treatment in placenta prævia, therefore, are clearly responsible for the loss of from 45 per cent. to 61.4 per cent. of the children. It is by this *enormous sacrifice of fœtal life that the immunity of the mother is sought to be secured*, while the inevitable results of extraction per vaginam, are hemorrhage, exhaustion and sepsis.

I do not hesitate, therefore, to declare my conviction that the delivery by the natural passages in placenta prævia of the more danger-

ous grades, at the present time, and in the existing status of the Cæsarean section, is an altogether unwarrantable procedure, and one directly antagonistic to the physiological processes of parturition. While, in cases of minor gravity, where the woman is at or near term, the placenta laterally attached, the os easily dilatable, the hemorrhage moderate, and the fœtus living and in normal condition, delivery may be very properly effected by version or the forceps, in the graver degrees of the affection, and in urgent emergencies we should have recourse to the Cæsarean section as soon as the diagnosis is made, or it becomes evident that the womb must be speedily emptied. This should be done especially in the interests of the child; but it will be, moreover, very greatly in the interests of the mother in all cases of total, partial or marginal implantation. *The womb should never be canalized in such cases*, the extrusion of the fœtus is *impossible* without a realization of the dangers characteristically attendant upon these grades of the affection. The Cæsarean section should be done, therefore, in place of inducing labor, as a *prophylactic measure*, as soon after the first bleeding as possible. The pregnancy must be terminated, if the hemorrhage has been severe; it is not justifiable to wait for a second bleeding; *the womb must be emptied*. Especially when labor is in progress does this indication become most cogent. As Spiegelberg observes, "The end which, above all things, must be kept in view, is to effect the emptying of the uterus as speedily as possible." (Quoted by Parvin.") This maxim applies quite as strongly to the Cæsarean section as to version or the use of forceps, in reference to which it was enunciated.

Let us now consider what would be the conditions of the Cæsarean section, and its probable risks to the patient and her child, when undertaken in placenta prævia.

Since its reconstitution by Sänger the Cæsarean section has been tested in a great variety of conditions, and the statistics have been steadily improving. It has been performed exensively in abnormalities of the pelvis arising from rachitis, malacosteon, dwarfing, kyphosis, ankylosis and coxalgia; in obstructions caused by exostosis, fibroids, carcinoma and cicatricial contractions; within the last few years it has been recognized as the correct mode of procedure in rupture of the uterus and vaginal vault, and has been repeatedly performed for eclampsia with rigid os, in pelvic contraction with eclamptic complications (Jewett), locked heads (Mudd), and *placenta prævia* (Sligh). In a publication by Leopold in 1888 (Die Kaiserschnitt und seine stellung zur Künstlischen Frügeburt, etc.), he reports the mortality of the operation in his clinic in Dresden during the previous four years at 8.6 per cent.; 4.3 being from subsequent sepsis; the fœtal mortality was 13 per cent. According to a report of E. Frankel in 1891, Leopold has succeeded in still further reducing the mortality, saving 95 per cent. of the mothers. Such a figure can only be attained by others when the rules

of procedure are rigorously followed and the operation done early. The great majority of the operations reported in the past have been performed after the failure of other measures, with an inevitable aggravation of the prognosis, or in patients exhausted by disease or tedious labor; a comparatively small number have been done as elective operations. When practiced as a last resource the mortality must be naturally higher than the average, from a variety of causes, including septic infection. Four years ago Caruso and Harris concluded that when done early, without previous exhaustion of the patient or fruitless attempts to turn or deliver by the forceps, the maternal mortality would not exceed ten per cent. The fœtal mortality will be about one in ten. Quoting from Leopold, Davis observes: "The mother must be not exhausted and in the beginning of labor; she must be free from septic infection and from severe injury from previous efforts at delivery. On the side of the fœtus, heart sounds must be normal in strength and frequency. When these conditions exist, the mother's chance for life ranges from three in four to nine in ten, while the infant has nine chances in ten for life." We have seen to what extent Leopold has improved the prognosis. The maternal mortality in total and partial placenta prævia is certainly not less than 20 per cent. under any known method of treatment. Depaul's statistics make it 30 per cent., while the fœtal mortality ranges from 55 to 83 per cent. and higher.

It must not be forgotten that the obstetrician is called upon to act, in placenta prævia, when the maternal system is already more or less profoundly disturbed by loss of blood. The fœtus, also, is at least equally jeopardized from this cause. This condition, however, dominates all modes of interference; it unquestionably impairs the viability of the child after delivery, and predisposes the mother to septic infection, but as its influence equally affects all the varieties of treatment, it may reasonably be neglected in a comparison of the various resources at our command.

If the Cæsarean section be performed as a prophylactic measure, instead of the induction of labor, or after labor sets in, before the genital tract has been injured by attempts at version or the use of forceps, contused by tents and bags or irritated by the tampon and powerful ferruginous astringents, or infected by the introduction of foreign bodies and air into the genital passages, the conditions of the case in reference to a proposed Cæsarean section would closely resemble those of a highly contracted pelvis, where the Cæsarean section had been recognized from the first as a unique resource. The prognosis for mother and child would be about the same as in such a case, except as regards the previous or concurrent hemorrhages of placenta prævia.

When practiced, therefore, in placenta prævia, as a primary and elective operation, the Cæsarean section would be done under decidedly propitious circumstances. The strength of the mother having been

restored as far as practicable by stimulants and nourishing food, and due precautions taken to prevent septic infection, the delivery would differ in most vital respects from that *per vias naturales*.

First.—There would be a freedom from the hemorrhage which depends upon the relations of the placenta to the womb, for the lower segment would not be canalized.

Second.—There would be little or no post-partum bleeding for similar reasons.

Third.—There would be less danger of sepsis after delivery, if the operation were aseptically done and the patient treated antiseptically afterwards. Leopold lost but 4.3 per cent. of his cases by sepsis after Cæsarean section, while the usual percentage of deaths by sepsis after placenta prævia is 17 per cent.—or four times as much.

Fourth.—There would be little risk of diffuse uterine thrombosis and its untoward sequelæ, because the utero-placental vascular orifices and the sinuses of the thin uterine wall would not have been strained or lacerated by the process of canalization, and also in consequence of the reduced tendency to sepsis qualifying the Cæsarean section.

Fifth.—The fœtus, although unavoidably subjected to the evil influences of hemorrhage, and also to the inevitable though moderate risk of extraction through the uterine wall, would not be slowly asphyxiated by loss of maternal blood, pressure upon the placenta or prolapsed cord, or the spastic action of ergot upon the womb.

The fatality to the mother is wholly due to the canalization of the parturient tract. In the categories hereafter specified all efforts at dilatation of the cervix, multiple incisions in case of rigidity, the use of tents, tamponade of the cervix or vagina, being intended to facilitate this canalization, are radically ill-timed; a prompt hysterotomy should supersede them all. The death of the child would constitute no contraindication to the Cæsarean section. It would not be septic if the case were otherwise uncomplicated and the membranes intact; the operation should be done in the interests of the mother.

There are many exceptions to the rule that the cervix in placenta prævia is soft, dilatable and more or less patulous. Rigidity of the cervix and stricture are computed to exist in 12 per cent. of the cases by Müller (Lusk). Still in nearly all cases the cervical opening is sufficient for purposes of diagnosis. Dr. J. M. Sligh, of Granite, Montana (*Am. Jour. of Obst., Feb., 1892*), seems to have encountered a case of this kind, in which he felt compelled at last to make a Cæsarean section. The case was one in the seventh month of pregnancy, of placenta prævia totalis. The woman had lost more or less blood during each month of pregnancy, and was much exhausted, having been six or seven days in labor. The cervix was undilatable. After a trial of Barnes' bags, which failed to dilate the cervix more than to admit two fingers, and an attempt at podalic version, the membranes were rup-

tured and the vagina tamponized with iodoform gauze. Some hours later, pains set in well, but the child was dead. The conservative method of Cæsarean section was then adopted, and the woman died twelve hours after the operation. The rigidity of the os was supposed to be due to carcinoma, but this is questioned by Rosenberg in the March number of the same journal. In this number also Dr. H. C. Coe relates the treatment of a case of placenta prævia with "very rigid os," complicating hydramnios and Bright's disease. It was necessary to make multiple incisions into the cervix. After about an hour, he succeeded in emptying the uterus, then stuffed it with iodoform gauze, which caused it to contract and controlled hemorrhage. The patient, however, succumbed from the shock of the operation which was the most difficult obstetrical procedure which he had ever undertaken." Mantel, in 1891, called attention to the frequent association of placenta prævia with hydramnios, regarding the uterine dropsy as the effect of the abnormal implantation of the placenta. Coe delivered as quickly as possible, in sympathy with Spiegelberg's dicta, most probably; but even with so skillful an operator, how plain the inference! How damning the condemnation of the accepted methods!

My personal experience in a similar case (1879) was no better. The child was slowly delivered by Hicks' method of version after full dilatation, to which nearly three hours were devoted, the shoulder presenting; it was born dead. The mother developed pyæmia on the eleventh day, in spite of assidious washing of the vagina with carboized and chlorinated solutions, and died on the fortieth day.

The woman in Dr. Sligh's case evidently perished in prolonged shock, as a consequence of loss of blood and the depression of the nervous forces, so often witnessed in cases of similar gravity. Dr. Sligh's final comment upon the case is as follows: "Had I made efforts at delivery *per vias naturales* immediately upon diagnosing placenta prævia, and failing then, at once made the section, it is probable that the patient's chance for life would have been better." I feel confident that if the Cæsarean section had been performed *immediately* after diagnosing placenta prævia totalis, *and before any attempt at delivery or dilatation of the os whatever had been made*, the patient's chances would have been *better still*.

Certain special features of a Cæsarean section done for placenta prævia require notice, and a brief outline of what would seem to be its appropriate technique will not, I hope, be out of place. When done as a prophylactic operation, the following points should be observed: The woman being on her side, a broad blade of a Simon's speculum should be introduced. A large camel's hair pencil carrying Churchill's tincture of iodine should be passed into the os and the bleeding uterine area freely painted. The vagina should then be freely douched and swabbed with a 10 per cent. solution of creolin, or preferably, perhaps, as Dr.

H. Tuholske suggests in this connection, with one-half per cent. solution of acetate of alumina in water. The cervical opening should be filled with iodoform gauze and the vagina loosely packed with the same material. The uterine incision should be made in the mesial line, rather higher than usual, so as to avoid the placenta, whose site will, of course, be approximately known. The constriction should be made with collapsible rubber-tubing, or by the hands. After extraction of the child, the placenta will be found more or less adherent in 40 per cent. of the cases, as Müller has stated. I beg leave to suggest that we should always most scrupulously endeavor to deliver the placenta entire and without laceration, and that the cord be not tied until the infant has respired freely. This is in accordance with cardinal maxims of obstetrics and also with the novel and very practical views of Sheldon Stringer, of Brookville, Florida, stated in a brief paper read before the Ninth International Medical Congress. Hæmatosis of the fœtal blood, he claims and shows, is capable of being maintained for a considerable time before respiration has occurred, by the contact of atmospheric oxygen with the maternal surface of the placenta. A varying quantity of the blood contained in the placenta would be aspired into the fœtal lungs when respiration begins, an accession of the vital fluid peculiarly desirable under the circumstances. It should be distinctly our aim, in Cæsarean section, to imitate physiological labor as closely as possible. The experiments of Budin, Schücking and Ribémont (1875–1879) are detailed by Lusk (1892) in support of the proposition that "the cord, in natural labor, should not be tied until the child has respired a few times, and that in children born pale and anæmic, suffering at birth from syncope, late ligation furnishes an invaluable means of restoring the equilibrum of the circulation." In Cæsarean section the child is always partly asphyxiated, and for these reasons alone the cord should not be hurriedly tied, so as to get the infant away from the scene of operation. But besides this, Stringer shows in his short, but most original paper, the remarkable effects of exposure of the placenta to the air, the cord being not yet tied, in assuring and hastening the resuscitation of partially asphyxiated children. In a late communication (June 20, 1892), Dr. Stringer, now President of the Florida State Medical Association, informs me that he resorts to the hasty delivery of the placenta in all cases of real or apparent asphyxiation, as quickly as possible removing clots or membranes from the maternal surface by use of a small quantity of warm water, and taking notice that the funis is not twisted or wrapped around the neck or limbs of the child. If there is any circulation in the cord when these arrangements are perfected, it will continue, and in all his cases normal respiration has been soon established. We should, therefore, regard it *as most important in the Cæsarean Section*, not to tie or divide the cord while the infant is asphyxiated. The placenta should be carefully extracted without injury, as rapidly as possi-

ble, the infant, meanwhile, being held near the mother. After its removal from the uterus, the child should be laid upon a table and the usual methods of resuscitation, especially Sylvester's, adopted. The surfaces of the placenta should be gently cleansed from clots, as Stringer advises, and placed near the child, resting on a folded towel, with the maternal surface uppermost and freely exposed to the air. In case the placenta was found adherent, I would rapidly withdraw the vaginal filling of gauze, as well as that placed in the cervix, and, after passing as much of the hand into the vagina as need be, would introduce the finger into the cervix and sweep it around, in contact with the uterine wall, in strict concert with the fingers of the other hand passed into the womb from above. We might thus succeed in detaching a placenta not too firmly adherent without lacerating it. In order to accomplish this, the rubber-tubing would have to be somewhat relaxed. If the placenta could not be extracted entire, the cord should be tied and the infant promptly removed.

This method of dealing with the placenta and funis I think should be extended to ordinary cases of Cæsarean section, for I believe it will render resuscitation of the child more speedy and certain, and, moreover, unquestionably improve the further chances for life of a premature child. A desire to remove the placenta intact and in continuity with the fœtus, may induce us to deviate from Sänger's dictum somewhat, and *wait for the spontaneous separation* of the placenta, as long as the urgent necessities of the occasion will permit.

The membranes having been stripped from the interior of the womb as completely as possible, blood clots should be removed with the hand, and the cervical plug of gauze withdrawn if not already removed as above stated.

Jewett advises against wiping or sponging the interior of the womb, although Sänger does this. Nevertheless, I would remove any bloody fluid remaining with pledgets of iodoform gauze. Having done so, after the administration of a full dose of ergot by the mouth, or of ergotole hypodermically, the cavity of the womb should be dusted with iodoform. A strip of iodoform gauze should be then passed through the os, with a pair of uterine dressing forceps, and the lower zone of the womb stuffed, but not tightly, with the same material, from below upwards, so as to allow of ultimate removal of the strip through the vagina. The uterine incision having been closed *secundum artem*, the intra-peritoneal douche should be omitted unless the abdominal cavity had been contaminated by liquor amnii. Delbet and Marcel (*Annales de Gynecologie*, 1891) have shown by extended experimentation the evil results of the contact of foreign substances with the peritoneum. "The healthy peritoneum," says Jewett, "would be less injured by the presence of a little blood than by sponging and irrigation. Handling increases the risks of adhesion. The usual peritoneal toilet, therefore,

can be almost wholly omitted if one avoids the escape of amniotic fluid or much blood into the peritoneal cavity." "The Cæsarean section," he thinks, "should come to give better statistics than laparotomy for disease." (*Am. Jour. of Obstetrics*, March, 1892.) I have not personally found, however, any results but the most favorable ensue from the judicious flooding of the peritoneal cavity with plain boiled water after laparotomy; *but I have* also very carefully avoided irritating the peritoneum by the *sponge*. Rough sponging, such as I have repeatedly witnessed, is responsible, without doubt, for a variety of bad results.

That the shock of a Cæsarean section may prove too great for the reactive powers of the economy after repeated, prolonged, or profuse hemorrhages, or harassing attempts at delivery by version, is plainly shown by Sligh's case, hence the necessity of early diagnosis and prompt action. If, before labor, the hemorrhage has been so profuse that acute anæmia exists, *any attempt* at extraction would be certainly fatal. It would be necessary *in limine* to check the hemorrhage temporarily. This I believe could be effected by the copious application of Churchill's tincture, after the manner already described, to the bleeding uterine surfaces. This application I would reinforce by stuffing the cavity between the placenta and uterus with iron-cotton, dilating the cervix with a steel dilator sufficiently to do this, if the os were not open enough; I would then stuff the vagina loosely with iodoform gauze, pass an opiate suppository into the rectum, elevate the foot of the bed, and administer gallic acid or acetate of lead and opium. Hemorrhage having been arrested, and any irregular uterine contraction abated by these measures, the strength of the patient should be restored by copious draughts of bland nourishing fluids, and rectal and subcutaneous or even intravenous alkalino-saline injections. If a favorable condition could be realized in this way, the patient should be closely watched, until her strength had been sufficiently restored to warrant the performance of the operation. Strong tincture of iodine, introduced many years ago by Wynne Williams, of London, is our best and safest intra-uterine hæmostatic; it is also powerfully antiseptic. I have succeeded in immediately arresting post-partum hemorrhages from intra-uterine tumors, *quite as grave* as any that occur in placenta prævia. I have also found it equally effective in the hemorrhage of threatened abortion, retained placenta, and a variety of conditions where the bleeding is due to rupture of intra-uterine vessels.

If labor was in progress, and similar conditions of exhaustion existed, I would act as just described, and endeavor to arrest the hemorrhage and restore the lowered forces. The cord, if prolapsed, having been first reposited, the application of the tincture of iodine within the cervix and of the cervical tampon of iron-cotton should be supplemented with a well fitted vaginal tampon of iodoform gauze. The pains should, if possible, be arrested by opiates, and the strength of the

patient restored by the measures already indicated. Otherwise, delivery would be fatal to both mother and child, and at any rate more dangerous than even a Cæsarean section.

If labor be declared, and the patient able to bear the Cæsarean section in the judgment of the operator, it should be performed without a moment's delay. In Rigby's case the woman died in two hours, from hemorrhage due to a placental attachment no bigger than a crown piece. All hemorrhage will cease as soon as the uterus is constricted with the rubber tubing. I would remove the vaginal packing after a few hours and replace it. If hemorrhage or oozing should occur or continue after the operation, I would repeat the application of the iodine and tampon the womb and vagina with gauze. Ergot should be administered under any circumstances every three or four hours, and an antiseptic pad kept over the external genitals. If the patient did not rally well after the operation, it would be well to bear in mind the utility of inhalations of oxygen in cases of acute anæmia. The mixture of this gas with nitrogen mon-oxide, now to be had on thirty minutes notice in all our large cities, might be employed both before and after the operation in combination with other measures, such as opiates, subcutaneous injections of ether and brandy, or even the injection of fifteen to thirty drops of a four per cent. solution of ammonia (the officinal solution diluted with an equal volume of water) directly into a vein with a hypodermic syringe, as used successfully by Gaspar Griswold in a number of cases where the heart had apparently beat for the last time (Lusk).

A Porro operation may become necessary under complicating conditions similar to those which Sänger enumerates as indicating ablation of the uterus after Cæsarean section performed for the usual reasons. These complications may nearly all coëxist with placenta prævia; intra-uterine myomata predispose to it. Among Sänger's well-known indications for Porro's operation, the following concerns us in this connection, viz.: obstruction to drainage of the lochial discharge by stenosis and atresia of the cervix and vagina or tumors unconnected with the uterus; myoma of the *corpus uteri*, especially the retro-cervical and retro-vaginal forms; infectious diseases of the body of the uterus, and also of the cervix, when the extension of infection to the corpus is to be feared, as in certain cases of carcinoma of the neck." When intra-uterine myomata are associated with placenta prævia, the child may be dead and septic. The child may die long before labor, under ordinary circumstances, and remain aseptic, being only macerated. Sepsis of the genital tract is essentially a post-partum complication of placenta prævia, but may occur, there is good reason to believe, before delivery, where the membranes have been ruptured prematurely and the case has been a tedious one, as in impacted shoulder presentation with undilatable os.

If hemorrhage should prove uncontrollable in consequence of the existence of retro-cervical tumors or hæmophilia, ablation of the womb would be necessary as in Stover's case in 1868, and Fasola's in 1886.

In general it may be remarked, that although in the experience of certain practitioners and by certain methods of treatment the maternal mortality has been very low or even *nil* in placenta prævia, the simultaneous fœtal mortality on the other hand has been disastrously great, so much so indeed that even allowing ten per cent. of *inevitable fatality* to the fœtus as the risk of the Cæsarean section no less than from *thirty-five to fifty-one per cent. of the children have been sacrificed to secure maternal immunity.* As these figures are based upon the reports of cases of all degrees of gravity, it is reasonable to suppose that in the graver forms of placenta prævia the fœtal loss of life due *to the methods of treatment* has been really far greater than even this. That the maternal life may be saved thereby does not warrant the institution of measures *so deadly to the fœtus.* The mother is bound by the peculiar duties of her sex and by the obligations of the sexual compact to assume additional hazards, if such exist by the Cæsarean section, in the interests of her child, in accordance with the principles discussed in the first part of this paper. Results like those obtained by Murphy, Hofmeier or Behm must be looked upon as altogether exceptional, for they have not been realized by other operators and are not attainable in ordinary practice. The average percentage of cases of all degrees of gravity, by the statistics of Barnes, Hecker, Spiegelberg and Auvard range from six to seventeen per cent. Müller even estimates the average mortality of the mother at not less than thirty-six to forty per cent. A Cæsarean section, therefore, in the more dangerous forms of placenta prævia, even at a risk of ten per cent. or more, will be unquestionably in the interests of the mother, very probably quite as much so as for the fœtus, if done promptly, and before other measures have been tried, and precious time lost thereby.

Sänger's operation is now thoroughly understood in all parts of the civilized word. Indeed, like version, and the use of the forceps, its technique constitutes one of the elementary chapters of obstetrics. It may, perhaps, be yet improved upon, but meanwhile, as a new resource for the various emergencies to which it is applicable, it must be passed over as we find it to the obstetric practitioner. Originally the offspring of surgery, having endowed surgery with antisepsis and laparotomy, obstetrical art is daily becoming more and more surgical, and its practitioners must prepare themselves accordingly. In 1887, W. T. Lusk, in a paper read before the obstetrical section of the International Congress, expressed himself in the following just and vigorous phrases:

"If it were proposed to a physician to beat out the brains of a new-born living infant with the view to diminish the perils of the puerperal period, the proposition would certainly be rejected as too

horrible for consideration, even though the physician were convinced that the theoretical grounds for the recommendation were correct. Yet there is a disposition to treat any hesitation to destroy the unborn child in the maternal interest as pure sentimentality.

"I must confess that I have never felt satisfied with this bit of casuistry, and I am sure that, for the bulk of the medical profession, nothing can be more welcome than to learn that there is statistical evidence sufficient to warrant us, in a very considerable proportion of cases, to decline, equally in the interest of the mother and the child, to lend our aid or countenance to the sacrificial operations of midwifery. * * * We have many laparotomists operating with brilliant results. * * * They need, however, to open their eyes to the work of our neighbors, and to equip themselves for the special field of saving infant life. Mr. Tait has doubtless accomplished great good, teaching surgical means for the relief of tubo-ovarian disease, but it would be an added glory to our laparotomists if they would, on occasion, round out their work of sterilizing women by conferring upon them the blessing of maternity."

Finally, I must observe, the day is now irrevocably past when the fœtus could be treated like a uterine tumor. I insist that the unborn child is as much our patient as the mother herself, entitled to equal regard, to equal protection. If medical men do not yet realize all that this implies, let them pause a while to study the ethical questions involved in the conduct of these anxious obstetrical emergencies. If the laity do not, or will not comprehend these things, they should be properly instructed, or if need be, sternly restrained by the arm of the law. For what can be more elusive, what more fallacious or hopeless, than to attempt to deliver a parturient woman by measures which violate every law of physiological labor? What is more deplorable than to slowly suffocate a viable fœtus by lacerating its placenta or tearing it from the walls of the uterus? What more cruel than to bear a death-dealing hand against our weak and voiceless patient, by using its body to compress its own respiratory organ, with intent to secure a mother from dangers imposed by nature upon her, and which she has voluntarily pledged herself to brave?

CONCLUSIONS.

First.—The dangers of placenta prævia, as well to the mother as to the child, are due to the development of the placenta upon the lower uterine segment, *and* to the *canalization* of this segment during labor.

Second.—While the first of these conditions cannot be avoided, the second should not be permitted in placenta prævia totalis, or partialis. Delivery should be by Cæsarean section.

Third.—In placenta prævia marginalis, if the circumstances were favorable, the os easily dilatable, the condition of the mother and child good, the head presenting or capable of being readily brought to engage,

and the hemorrhage arrested or moderate, it would be well to follow the method of intra-uterine and vaginal tamponade and deliver by forceps if the child should be in danger. But, if the os were rigid, the hemorrhage profuse, the presentation lateral, the cord prolapsed and not reducible, or the *fœtus evidently suffering*, I would have immediate recourse to the Cæsarean section.

Fourth.—The Cæsarean section should be performed as soon as the diagnosis is established and the condition of the mother permits, to the exclusion of all other methods, as an elective and primary operation, in all cases of *placenta prævia totalis* and *partialis*, and as soon as the conditions warranting it, in placenta prævia *marginalis*, have been satisfactorily determined.

Fifth.—In the two graver forms of placenta prævia, the Cæsarean section should be practiced as a prophylactic measure, in place of any attempt to deliver by the natural passages, after the first hemorrhage.

Sixth.—In cases where hemorrhage is late or sets in only as labor begins, and where, consequently, the placenta is most probably attached laterally, it is advisable, until this entire subject has been practically studied, to deliver per vaginam, as a rule. If therefore the cervix be easily dilatable, and the hemorrhage moderate, we may proceed as suggested in the more hopeful cases of marginal implantation. But *even here*, an undilated os associated with severe hemorrhages would constitute a very serious condition. If the rigidity were due to fibrosis, it should be abated by multiple incisions, if to carcinoma the radical Cæsarean section would be indicated. If the cord were prolapsed and after reposition still descended, the os being partly dilated, and not dilatable, dangerous hemorrhage continuing meanwhile, the Cæsarean section would be unquestionably indicated for the safety of both mother and child.