

in certain diseases for the treatment of which immune serums have thus far been found inadequate. It is well known that highly immune typhoid serums not infrequently cause solution of the specific bacilli. It is, however, an almost universal experience that the injection of such highly immune serums into patients suffering with typhoid fever is not followed by any appreciable amelioration of the symptoms. One would imagine that solution of the bacteria must necessarily follow, but the difficulty seems to be that it is not the immune body, in which the serum is rich, but the complementary body that is needed. This might be supplied with ease, could we find out just what serum best furnishes it, yet its addition might not be followed by the expected result, for the reason that the order of combination is so essential. Thus, Richardson found that the injection of normal serum containing the complementary body did not improve typhoid fever, because the immune body having been preformed in the body, interfered with the necessary primary action of the complementary body upon the bacteria.

Experimenting with bacteria in the hanging drop, he found that if it was true that a mixture of typhoid culture, normal serum and typhoid immune serum produced hemolysis, it was almost certainly not true that typhoid bacilli, immune serum and normal serum would do so, the difference being solely in the order in which the combination took place.

Wassermann also demonstrated the accuracy of Ehrlich's view by his experiments with typhoid infection, and concludes that two separate substances are concerned, one of which kills the bacteria, the other serving to fix its combination with them. To the bactericidal substance he applies the name "end body," that which fixes the combination the "intermediate body." Experimentally he found that normal beef serum was best adapted to the supply of "end body," so that when he inoculated guinea-pigs with three loopfuls of typhoid culture, and after 30 minutes gave them a hypodermic injection of 0.5 c.c. of typhoid immune serum and 4 c.c. of fresh normal beef serum, they recovered, while the control animals which received normal serum, or immune serum alone, all died in 24 hours.

The number of cases reported by men of trained observation, in which the injection of normal serums has been followed by improvement in various diseased conditions, can be in part explained upon the assumption that it supplied to the blood some *intermediate* or *complementary* substance, essential to the proper performance of physiological function, but which is temporarily deficient.

How widespread and important these immune and intermediate bodies may be in our processes it is impossible to say, but the recent observations of Metchnikoff indicate that they have very wide spheres of usefulness.

Metchnikoff found that the introduction of any kind of cellular tissue into the body increases the ability of the blood to act destructively upon that kind of tissue. Thus, if blood of one animal is injected into another, its serum becomes hemolytically active. If comminuted epithelium is introduced, the serum becomes epitheliolytic in its tendencies, etc.

Here we find an entirely new reaction, with an entirely new sphere of usefulness. Unfortunately, it is still too new to predict what may be the value, if any, of this phenomenon in practice. The possibility of thus attacking cancer at once appeals to us. How desirable it would be to produce a serum whose activity would be

to inhibit the growth of epithelium and hasten the destruction of epithelial cells!

However, the lesson that is to be learned from the achievements thus far consummated is that the action of immune serums is far from simple, depends upon many factors with which we are just beginning to become acquainted, and that the failure of our efforts in many directions in the past may simply be referable to our ignorance of how to use materials at hand.

## THE PREVENTION OF PELVIC DISEASE DURING AND AFTER LABOR.\*

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The prevention of pelvic disease during and after labor consists in the avoidance of infection and traumatism. Infection is frequently the almost necessary result of traumatism, but traumatism without regard to infection is frequently followed by more or less serious pelvic disturbances.

### CLEANLINESS NECESSARY.

During the course of an otherwise normal delivery, the great danger to the mother is from infection carried in from without. No modern physician, I take it, believes in auto-infection, that is, in any infection arising from within the pelvis. A chronic disease of the appendix, or of the appendages, may be lighted up by the process of delivery, but no pelvic disease will be initiated except by infection from without. This infection may be introduced in a variety of ways. The very latest bacteriological investigations have shown conclusively that the secretions of the upper part of the vagina are entirely sterile. It is not until they reach the introitus that they show evidences of contamination. The introduction of the examining finger inevitably carries some of this infection from the vulva into the vagina and up to the cervix. Copulation has the same effect. Many women practice self-examination, and this doubtless accounts for certain otherwise obscure cases of puerperal infection in which the attending physician after his arrival has exercised all due precautions.

Before the introduction into obstetrical work of antiseptics, and later of asepsis, the mortality in lying-in hospitals, where infection was carried from patient to patient, was simply frightful; but with the recognition in these institutions of the sources of danger and the means for their avoidance, the mortality has decreased until now a properly managed hospital is the safest possible place for a woman to be confined, not only as regards mortality, but morbidity. The same is not true, however, in private practice. The investigations of Bacon of Chicago, and of Boxall in England, show conclusively that in general practice, and especially in rural districts, puerperal mortality and morbidity are practically no less than before the days of Lister. It is the general practitioner, therefore, who must improve his methods.

The use of antepartum douches, as recommended some years ago when the vaginal secretions were regarded as infected throughout, is to be unequivocally condemned. These secretions are nature's lubricant and should not be unnecessarily interfered with. If, however, from his knowledge of the case, the physician suspects a gonorrheal infection to be present, then not only should

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the douches be used, but the vagina should be scrubbed out as thoroughly as before a surgical operation. This cleansing is done not only in the interests of the mother, but in the interests of the child, for the prevention of gonorrheal ophthalmia. In the absence, however, of such known or suspected infection, the special cleansing processes should be limited to the vulva and the region about. If this is done, and the practitioner uses the ordinary precautions as to the cleansing of the hands and instruments, puerperal infection will not take place.

In giving directions as to the cleansing of the hands of the attending physician it is entirely useless to advise any such extremes of asepsis as will not be carried out. These precautions must be limited to such as are feasible and sensible. I have seen explicit directions given requiring at least ten minutes for the scrubbing of the hands with soap and hot water, and then three minutes' continuous soaking in a 1 to 1000 bichlorid solution; or a similar scrubbing of the hands with subsequent treatment with permanganate of potash and oxalic acid. Such precautions are not feasible in general practice and will not be carried out. If the attending physician scrubs his hands thoroughly with hot water and soap, and if his nails are trimmed short and kept clean, he has done all that can reasonably be expected of him. If, however, he has reason to believe that his hands have been infected by contact with other cases, then the more thorough sterilization previously indicated would be required. If, moreover, an obstetrical operation is needed, involving the introduction of the hand into the uterus, as for turning or the removal of secundines, then the most thorough sterilization of the hand and arm is essential, or, better still, the use of the rubber glove and armlet. For the application of forceps the instrument itself should be sterilized by boiling. This, with the thorough washing of the hands, as above indicated, and the cleansing of the vulva will suffice. The finger-nails of the physician are the main source of danger. Many physicians, especially in country practice, are obliged, to a considerable extent at least, to care for their own horses and to do more or less work about the garden. Such men are very apt to have horny hands which in bad weather are quite liable to become more or less chapped and fissured. It is quite impossible to render such hands absolutely sterile. In such cases rubber gloves can not be too highly recommended.

While the presentation and position of the child can be determined under ordinary circumstances and without any special difficulty by external palpation, this procedure conveys no information as to the condition of the cervix or the progress of labor. This latter knowledge may be unimportant in a lying-in hospital, where nurses and internes are always within reach, but it is of prime importance to the general practitioner, whose duties require him to look after other cases than the patient in labor. He makes a vaginal examination and decides whether he must remain or whether he can be at liberty to make other calls for an hour or more. At the end of the period which he had allowed himself, he returns and another examination enables him to determine for the second time whether he can be spared. These examinations are essential and to forbid them is simply visionary. For these cases, rubber gloves, which can be left in an antiseptic solution during the physician's absence, are a very great convenience and of great value, though not absolutely essential.

Postpartum douches, like the antepartum, should not be used in normal cases. The natural downward flow of the lochial discharge prevents infection from reach-

ing the uterus, while the use of the syringe nozzle, even if just sterilized, may carry infection from the vulva to the cervix, and even within it. In case, however, infection takes place and the lochia becomes offensive, then the use of the vaginal douches carefully administered by a skilful nurse is to be commended.

#### REMOVAL OF MEMBRANES.

In case a portion of retained membrane or placenta becomes infected, or causes hemorrhage, it should be at once removed. Here, however, the use of the curette has resulted in great harm. A blind curetting of the endometrium under these circumstances will open up a thousand channels for fresh infection while removing the offending body, although it not infrequently happens that the offending bit of tissue itself may in whole or in part be missed by the curette. Under such circumstances the misdirected instrumentation will be followed by a fresh invasion of sepsis, with perhaps promptly fatal results. For the removal of such retained tissue no instrument is as sure and safe as the sterilized finger of the intelligent physician. Give the patient chloroform, sterilize the vagina by thorough scrubbing, sterilize the hands, and then steadying the uterus from above with one hand, introduce the finger and explore the interior. The finger will find the offending tissue and will almost invariably remove it with ease. In case it is too adherent the curette may then be used directly to the spot and without injury to the rest of the endometrium. Such removal should then be followed by a hot intra-uterine douche, so as to thoroughly wash out debris. This douching should be done by the physician himself, and once is sufficient if the preceding removal has been thorough.

#### TRAUMATISMS.

An overlooked laceration of the perineum, even if the laceration be very slight, furnishes a point for puerperal infection. A lacerated cervix rests in the sterile region of the vagina, but a lacerated perineum is in the region constantly exposed to infection. This exposed surface is promptly removed by an immediate operation. There is no excuse for a failure to detect this injury, since an examination under the eye should be made in every case, nor is there any excuse for failure to close the laceration immediately, since the materials for so doing are in every house. It may be more convenient and look a little more professional for a practitioner to have with him silkworm gut, special needles and needle forceps, but these are entirely inessential. A small darning needle, or a heavy sewing needle, with its temper removed through the center by heating so that it can be somewhat bent; silk, which can be found in nearly every house, or even cotton or linen, hair from the horse's tail, or even a cow's tail for that matter, all these are everywhere available, can be promptly sterilized by boiling and will answer just as good a practical purpose as anything that can be found.

Lack of assistants and of suitable light and instruments render it undesirable to attempt an immediate operation on a lacerated cervix; while the fact that this cervix is in the sterile zone and will very likely heal satisfactorily without further attention, renders its closure of little importance. A laceration, however, involving the vagina and perineum belongs to an entirely different category, for reasons which I have stated, and these lacerations therefore should be repaired either at once or within twenty-four hours.

It will, of course, be useless to cleanse the vulva preceding examinations if the sheets and dressings which

are to come in contact with the cleansed surfaces are dirty. In most houses when labor begins the resources of the ragbag are drawn upon for the construction of an absorbent pad to be placed under the hips of the parturient. If the rags from these sources are clean nothing more can be asked for, but ordinarily their condition is the reverse; hence the attendant should insist upon a sufficient supply of clean sheets, towels, pillow slips, or something of the sort, to secure the necessary protection of the field of delivery both during labor itself and during convalescence.

Rupture of the uterus occurs much less frequently now than it did a generation or two ago, when physicians showed an almost inexplicable disinclination to assist nature by instrumental intervention. The dangers incident to a prolonged second stage are now quite thoroughly recognized and it is seldom that a normal uterus ruptures simply as a result of thinning of its walls from too long continued expulsive efforts or from pressure necrosis. Most frequently rupture occurs either from the presence of a fibroid which has produced pathological thinning, or from efforts at turning made with too great vigor or too long after the rupture of the membranes. The prudent obstetrician recognizes the fact that in certain conditions of the uterus, when the contractions are unusually violent or persistent, the introduction of the hand and the manipulations necessary to turning are fraught with the utmost danger, and the dangers under such circumstances may be much greater even than those of a Cesarean section.

Lacerations of the cervix, vagina and perineum may be considered together, and here I think the present generation is guilty of sins of commission vastly more than our predecessors were guilty of sins of omission. It is confessedly impossible in all cases to prevent these lacerations, but in a large proportion of cases, altogether too large a proportion, these lacerations are the direct result of the too hasty or injudicious use of the forceps. I say this advisedly and as a result of several years of careful investigation of hundreds of cases that have come to me for treatment for conditions the direct result of these injuries.

A normal labor may be defined as one that terminates within twenty-four hours from its beginning, and without injury to mother or child. Of this twenty-four hours all but one or two hours will be taken up with the first stage. Much more than this time may be consumed in the first stage without harm to either mother or child. If the first pains are not too frequent or too severe, a first stage may, without being pathological, last for even two or three days with no effect whatever upon the child, and with no ill-effect upon the mother. An ordinary second stage, however, will not exceed two or three hours, although many times even a longer second stage, if the pains are not particularly frequent or strong, is perfectly normal.

A normal labor should not be interfered with, and any interference, manual or instrumental, is fraught with more or less danger to mother or child, or both. I make this statement deliberately and advisedly. Our predecessors were too timid, and as a result of this timidity, to use no harsher term, many lives were sacrificed, great and unnecessary suffering was endured, and infinite morbidity ensued. But too many physicians of the present day have gone to the opposite extreme, so that their sins are those of commission. The too early and too frequent resort to instrumental delivery is responsible for many serious results. A dead baby with a crushed or disfigured head; a ruptured cervix, vagina and per-

ineum; a collapsed and moribund mother, with a history of forceps delivery undertaken 12, 10, or perhaps only 6 hours from the onset of a first labor, is a picture which is to be seen too often in the experience of a consulting surgeon. The scene does not always close with the lethal exit of the mother, or even of the child, but there follows a tedious convalescence after an immediate operation on the lacerated perineum, with a later operation for the repair of the torn cervix. That is all, provided the patient escape the removal of appendages, made necessary by resulting infection.

A year ago an enthusiastic young gentleman presented to this Society a paper pleading for the earlier use of the obstetric forceps. It is most significant, not to say amusing, that this year the same gentleman is announced for a paper on "The Repair of the Perineum."

It should be impressed most vigorously and pertinaciously that labor is a physiological process and that under all ordinary circumstances delivery will be naturally and safely accomplished. If a physician has not time to do obstetrical work he may refuse engagements or decline the call when it comes, but if he has once accepted the case he is bound professionally, morally and legally to give to the woman and her unborn child all the time that may be necessary for her safe delivery, and no honorable and conscientious physician will do otherwise.

#### OBSTETRIC FEES TOO SMALL.

I know that in many parts of the country, indeed in most, the fees which physicians receive for obstetric work are ridiculously inadequate. There is no comparison between these fees and the fees received for the ordinary routine work of the profession, and yet the lives and well-being of two individuals, and the happiness of many others, are at stake in every labor, and the responsibility of the physician is correspondingly great. I doubt, however, if the ordinary physician in the state of Ohio receives on an average \$10 per case for his obstetric work, this fee including not only his attention during the progress of the case itself, but by custom one to three subsequent visits. I know of nothing in our profession in which reform is more needed than in this particular. An obstetric engagement, carrying with it the responsibility which it does, should certainly furnish as much compensation as a mere broken leg. It is true, perhaps, that among the poorer classes no larger fee can be paid, but the principle should be so far established and the fee-bill so changed that, as in other surgical work, the fees of the rich should make up for the lack among the poor, while for the poorest classes in general clean, skilled midwives could advantageously take the place of physicians for ordinary attendance, the physician being sent for merely in cases requiring intervention or the repair of lacerations.

#### MISUSE OF INSTRUMENTS.

Instruments should be used only in the interests of the mother or the child, and never simply to save time or suit the convenience of the physician. Convulsions, threatening the life of the mother, or labor so prolonged as to threaten the integrity of the uterus, exhaust the mother or destroy the child, undoubtedly demand instrumental intervention even at the risk of laceration of cervix and perineum. These can be repaired, but the life of the child or the mother can not be restored. With the soft parts dilated or dilatable, but with such a disproportion between the passage and the passenger as will result merely in a long and exhausting, even if not dan-

gerous, second stage, the forceps should be used; but the attendant should be fully satisfied that the soft parts are in suitable condition, since otherwise even if the superficial parts remain intact the underlying fascia may be lacerated with resulting loss of support to the pelvic organs.

But this has not been the teaching, I am afraid, of modern obstetricians, at least if the teaching can be determined by the practice of those who have been taught. I think it is the experience of every man having a large consultation obstetric practice, to be called repeatedly to cases by the physician, who expects him to at once deliver with forceps, and to find the patient in good condition, the membranes unruptured, the cervix half or two-thirds dilated, the vagina only partially relaxed, the perineum not yet reached by the descending head and its tissue far from ready for delivery; the patient a primipara in whom labor had commenced six to twelve hours before. Were convulsions present he would unquestionably apply the forceps and deliver with perhaps a saving of the child and rupture of cervix and perineum. He knows that the woman will deliver herself, if given a reasonable length of time, safely, satisfactorily and without intervention. He explains the matter to the attending physician and sees the case with him three or four hours later. Finds labor progressing and again postpones intervention until finally the patient delivers herself. The attending physician, if wise, has probably been taught his most valuable lesson in obstetrics, the lesson of judicious waiting.

But this is evidently not the teaching which too many young men receive before their graduation, or perhaps after it. In the *Philadelphia Medical Journal*, of April 13, page 706, in this, the first year of the twentieth century, is an article by a well-known teacher of obstetrics in a New York post-graduate school, in the course of which the writer, in alluding to a series of his cases, states that these cases were nearly all of them "operative ones or were made so because of the presence of an ever-inquiring audience. All my cases were delivered before an audience of physicians who . . . were unwilling to camp over night in a pauper hospital to watch a tedious labor case. . . . Most of the cases would have delivered themselves normally."

Here now is a teacher who reports his work without apparently a suspicion of impropriety. He has performed these operations before a class of physicians who, impressed with the utter indifference with which he interferes with what he confesses is normal labor simply to demonstrate to them methods of procedure, will return to their own homes prepared to carry out in their private practice that which they have thus seen demonstrated in a public clinic. Such practice and such teaching are wholly bad and utterly indefensible. If the anti-vivisectionists should get hold of that teacher and his work I think before they got through with him he would have learned that there is a God in Israel.

Meddlesome midwifery is bad. This is a statement as old as intelligent obstetrics, but the misuse of this aphorism has done much mischief, since timidity born of ignorance does not properly weigh the meaning of the word meddlesome. Meddlesome midwifery is not that which intervenes in abnormal or pathological conditions, but it is that which interferes officiously with normal processes. In conclusion, then, the prevention of pelvic diseases during and after labor consists, in a word, in cleanliness, patience and intelligent intervention.

## PREVENTION OF PELVIC INFLAMMATORY DISEASES AFTER MARRIAGE.\*

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Our present knowledge does not extend far enough to enable us to have any influence in preventing benign and malignant growths of the female pelvic organs. For this reason they will be wholly disregarded in this discussion. I have, therefore, somewhat modified the title of my paper as published in the program and will limit my remarks to the prevention of inflammatory pelvic diseases after marriage, as they are preventable in a large majority of instances.

It has been said that statistics are worthless, but I am convinced that carefully tabulated records of cases coming under the observation of physicians are very valuable, especially when honestly used in a discussion like this one. The following statistics have been taken from my private office records, where every case that enters my consultation-room is carefully recorded. These results may be of interest and value to us in this discussion. The records show that in 498 cases of inflammatory disease of the uterine appendages, or of inflammation in the pelvis, or both, including those having one or many attacks, the infection was due to the following causes: Gonorrheal infection that could be distinctly traced, 247 cases. Of this number 101 required an abdominal section for relief, and of this number a large majority were pus cases. The remaining gonorrheal cases, 146, were not advised to have a section made. Their disease was not serious enough when I saw them to justify a section for the removal of the appendages, and other means were instituted for the relief of their symptoms. How many of this number subsequently came to the operating table the writer is unable to say, but he is reasonably certain that a number of them would eventually be compelled to have a section made for relief. In 143 cases the cause of the inflammation was either an abortion that was unavoidable or induced. A very large percentage of the cases were induced abortion, usually done by the patient herself. Of this number 29 had to be subjected to a section for relief and 114 were otherwise treated, most of them making symptomatic recoveries. I wish it distinctly understood, in passing, that these cases, both gonorrheal and septic, were almost all of them of long standing, from a few months to a number of years, before consulting the writer. Especially is this true in reference to the cases which were subjected to an abdominal section where the cause of the disease was an abortion. In 52 cases the cause of the inflammation was due to the laceration of the cervix and perineum, with malposition of the uterus. Of this number 18 cases were subjected to a section. The remaining number were otherwise treated. Exposure during the menstrual period, or "taking cold" at that time, was recorded as the cause in 29 cases. In the majority of these cases the patients were unmarried, and there is reason to believe that some other cause might be assigned. In 9 of these cases it was necessary to make a section for their relief and 20 did not require a section. Tubercular peritonitis was the cause in 27 cases. Of this number 20 cases were subjected to an abdominal section and 7 were not so advised, because the latter number had no accumulation of fluid or pus that could be diagnosticated.

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