THE diagnosis of puerperal infection, as a rule, is not difficult, but the determination of the variety of the infection, and the course it will pursue is frequently attended with insurmountable difficulties. Bacteriological examinations of the lochia and of the blood do not afford us the aid in diagnosis which many claim for them. Bacteriologists surround themselves with too many casuistic refinements to be of much help to the clinician at the bedside. They lay so much stress upon the hæmolytic and non-hæmolytic properties of the streptococci, and in the same breath they tell us the non-hæmolytic variety may become hæmolytic, and vice versa. Further, they tell us, and we know it to be so, streptococci are found in the gravid and puerperal woman, without any pathological significance. Hence, a woman in childbirth with fever due to other causes, might have her condition erroneously diagnosed as puerperal infection, because streptococci were found in the lochia. Still we would not wish to be understood as totally disregarding the value of bacteriology in the diagnosis and prognosis of puerperal septic infection. A given case must be subjected to the most careful clinical scrutiny and then, in cases of doubt, bacteriological examination of the discharges and of the blood may be of some value in diagnosis and prognosis. He who would detect an infection at the onset, would see to it that every puerperal woman had the temperature taken per rectum, at least twice daily. In the presence of a temperature above the normal, he should not throw dust into his own eyes no matter what he would do to the eyes of others by attributing it to nervousness, indigestion, malaria, and milk fever. Before an audience like the present, it is superfluous to state that the flow of milk into the breasts is not attended with fever. Malaria at the present day, need not be guessed at. It can be excluded or established by the absence or presence of the plasmodia. Fever, therefore, in the puerperal woman is prima facia evidence of puerperal infection. But the
evidence requires to be thoroughly sifted; many cases will show a temperature of two or more degrees above the normal, for one or two days, during the first week constituting the group the Germans have termed "one-day fever cases." Zweifel, we think, has detected the etiological factor in these cases, in the presence of the blood clots that accumulate in the cervix at the termination of the third stage of labour. Be this as it may, ever since we have adopted his suggestion of manually removing all the blood from the cervix at the end of labour, we have seen fewer of the so-called cases of one-day fever. Constipation is frequently held as a cause of fever in the puerperium, and every one of us has seen the temperature suddenly shoot up to 105° or 106°, and as suddenly drop to the normal after a thorough emptying of the bowels. To our mind, the constipation acts only in an indirect way, by the faecal mass accumulated in the rectum forming a direct barrier to the escape of the lochia, either from the cervix, or from the upper part of the vaginal canal. In what other way could an overloaded bowel give rise suddenly to such a high temperature which would disappear as suddenly with the removal of the faecal mass? Here, also, we need not grope in the dark. The insertion of the finger into the vagina will detect the hard bulging posterior wall and the obstruction to the outflow of the normal discharges.

Having disposed of the milder forms of infection we are prepared to take up the more serious cases. You will have observed that we have studiously avoided using the term "sapæmia." We have always deemed it a misleading designation and are gratified to find that this is the stand taken, at the present day, by most authorities. The bacteriologists have taken away, recently, the last prop, which so long held up the structure of sapæmia. They have shown that in these cases of so-called sapæmia streptococci are found of the anaerobic variety possessing the same pathogenic features as the aerobic. They have found them in the blood and in some fatal cases they were the only variety present. When we, therefore, are face to face with an infection, we can no longer lull ourselves into a false security by assuming that we are confronted only with the sapæmic variety of infection. The question is only whether we are dealing with a mild, severe, or rapidly fatal infection, bearing in mind all the time that the apparently mild may at any time develop into a severe or even fatal form.

Having concluded from our bedside observation that we are dealing with a puerperal infection, our next step should be directed to endeavour to ascertain the form and the course it is likely to
follow. To do this, a careful local inspection should be made, follow by a bimanual examination of the pelvic contents and, if possible, by a digital exploration of the uterine cavity. The perineum and vaginal canal should be thoroughly inspected for any tear or abrasion, and if such is found, a note should be made of the appearance of its surface, whether it be clean-looking or covered with a grayish membrane. If the perineum had been sutured, the sutures should be removed, so that the wound may be thoroughly inspected, remembering, however, that the infectious organisms may enter through such a wound and yet cause little or no local reaction. In such a contingency, the infection rapidly becomes general and leaves us in no doubt as to the nature of the case. In the majority of instances, however, the organisms are not so virulent, they cause a local reaction and travel upwards along the blood or lymph vessels, more frequently along the latter. In that instance, an exudate or peritonitis develops with the signs and symptoms that accompany them. The treatment of these will be taken up later. At the present time, it will suffice to state that the treatment of infected areas in the perineum or vaginal canal should be based on general surgical principles of cleaning the wound and providing for free drainage. Next, the cervix should be exposed with a suitable speculum and note taken of its tears or wounds. Having failed to find any probable site of the infection in the perineum, vaginal canal, or cervix, our further step should consist in making thorough exploration of the uterine cavity with the finger or fingers. We are safe in asserting that fully 90 per cent. to 95 per cent. of the cases of puerperal infection originate in the interior of the uterus. A very large percentage of these are due to placental remains. A digital exploration of the uterine cavity is not always easy of execution, and may call for general anaesthesia. Here it may be well to draw attention to the fact that placental residues, even of good size, do not always manifest themselves by haemorrhage or fetid lochia, as is generally stated. We have frequently observed them in cases in which neither of these symptoms was present. Having found placental remains, what is the treatment to be instituted? Here we encounter a great diversity of opinion. At the present time, the trend is toward a “let alone” policy, unless there be haemorrhage. We must confess we are not in sympathy with such an attitude, we are of the opinion that the careful removal of such infected products of gestation will frequently arrest the process or aid very materially the economy to overcome the infection. How is the removal to be accomplished,
with the finger or with a sharp or dull curette? Many a lance has been broken on this point. To us it seems a matter of less importance, with what it is done and as to how it is done. One man may accomplish the object in view better with his fingers than he could with an instrument. Another feels safer with the use of the sharp or dull curette. We confess to belong to the latter class. A great deal has been said and written upon the dangers of breaking down the protection wall, which nature forms underneath these infected tissues in the uterus. Based upon this fear, an author (T. J. Watkins, of Chicago) recently has advocated the packing of the uterus with gauze, in order to effect a separation and expulsion of the placental remains. To our minds it would be difficult to conceive of a more dangerous procedure. If we have learned anything in the past years in the matter of infection, it is that there is no better way of making a local a general infection than by employing means to prevent drainage, and to place the infected area under high pressure. Every one to-day recognizes that a strip of gauze in the uterus, even as a drain, interferes with rather than facilitates drainage, leaving aside the fact that it always increases decomposition. If gauze used loosely as a drain acts just in the opposite manner, what will it do when it is packed tightly and kept in position for twenty-four hours?

After removing the placental remains, it is our custom to irrigate the uterus, either with 50 per cent. alcohol, or a weak solution of iodine. Thereafter, the uterus is religiously left alone. Ergot, strychnine and quinine are given in suitable doses, to aid uterine contractions and involution.

The indiscriminate use of the curette cannot be too strongly condemned, and one cannot emphasize too forcibly the great harm that may be done when it is employed in a haphazard manner, as frequently is the case. Our advice would be, when in doubt do not use the curette; usually the opposite course obtains, because the patient has fever she is subjected to a curettage. It is scarcely necessary to add, the curette should not be used for septic and gangrenous endometritis. Here there is great danger of breaking through the protective zone which nature forms, leaving aside the impossibility of removing all of the diseased endometrium. It is doubtful, even, whether intrauterine irrigations in these cases do not do more harm than good. If the discharge be very profuse, an occasional irrigation with some bland fluid to wash away the excess of discharge may be beneficial.

The formation of an exudate is, as a rule, a favourable omen and is nature's method of limiting the infective process.
Post-partum exudates may be divided into three groups. One group will undergo complete absorption, in a period varying from a couple to several weeks, under any form of palliative treatment, if the patient be only kept at rest. We have thought the absorption was hastened in many of these cases by the employment of dry heat over the lower part of the abdomen. Into this group falls by far the largest proportion of cases.

A second group forming a fairly large percentage of cases, will apparently remain stationary for a variable period, and then show signs of softening or suppurating. We always suspect suppuration when recrudescence of the fever occurs after an afebrile period, even though fluctuation may not be obtainable. When suppuration has once occurred, the obvious course is to make a good sized incision, and provide for free drainage. We deem it more prudent to abstain from irrigating the abscess cavity, at the beginning.

The exudates of the third group, fortunately forming only a very small percentage of the cases, consist of strong, hard formations, filling sometimes the entire pelvis, and even extending up to the umbilicus. There is no form of treatment, that we know of, that has any influence upon these cases.

The next variety of infection we desire to discuss is that formerly known as pyemia, but which in recent years has been described as septic thrombophlebitis. This form of infection has acquired particular interest ever since Trendelenburg, in 1902, cured a case by ligating the affected pelvic veins. You all know that it was the brilliant results obtained by the aural surgeons with ligation of the internal jugular vein in septic sinus thrombosis that led Trendelenburg to the procedure. The same line of reasoning had induced Freund already in 1898 to a similar surgical intervention. But his case and Bumm's subsequent two cases ended fatally. No further attempts were then made until that by Trendelenburg, already referred to. Since then, as you are aware, quite a considerable literature upon the subject has sprung up. To us the operation appealed very strongly, and we were among the first, if not the first, to perform the operation on this continent.

In reference to diagnosis, further experience has only confirmed what we have stated on a former occasion. We said, "Some authors, notably Trendelenburg among others, have laid stress upon the occurrence of repeated chills and would feel warranted in operating on the occurrence of the second chill. Such an inference, we all know, would frequently lead to error. First, we have seen cases with more than two chills that afterwards pursued
a mild course until complete convalescence. Secondly, cases of genuine thrombophlebitis will be met with in which a chill may not occur during the entire course of the disease. In one of our cases, the first chill occurred on the twenty-third day, and the second chill on the twenty-sixth day of the infection. The third and last chill in the entire course of the protracted illness, covering fifty-two days, followed an intravenous infusion, which no doubt caused it."

What we have found of great diagnostic value is a great elevation and depression of the temperature curve within the twenty-four hours, a difference often of 5° to 6° or more between the extremes. This is usually associated with a pulse varying from 80 in the afebrile stage to 110 or 120 at the height of the fever. Characteristic of the pulse is its good quality, which is usually maintained until nearly the end. The patient usually has very few subjective symptoms and the appearance, as a general rule, is good. These features, together with practically a negative result of a pelvic and abdominal examination, will in most instances warrant a diagnosis of septic thrombophlebitis. Some excellent observers (Bumm and Veit) lay stress on being able to palpate—through the abdominal wall or on pelvic examination—the thickened and thrombosed veins as tortuous worm-like structures. We frankly confess we were able to elicit this objective sign in but a few of the acute and subacute cases coming under our observation. We reached a diagnosis, in most instances, rather by the negative result of our local examination, and by a process of exclusion, than by any positive findings objectively.

Thus far, our experience with ligation of the affected veins alone has not been encouraging. The operation was attended with, seemingly, only a temporary benefit. The temperature fell for a couple of days and then the disease ran the same course as prior to the operation. However, it seemed to us, judging from the condition found, that had intervention been resorted to earlier, recoveries might have ensued. This much we feel safe in asserting if the operation did no good, it did not do any harm. The patients withstood it remarkably well, there was no apparent shock, and if anything there was an improvement for a few days.

While our results thus far with ligation of the veins alone have been negative, on the other hand they have been very gratifying when with the ligation of the thrombosed veins, we removed the uterus also. We have up to the present time operated upon nine cases with six recoveries. One of the fatal cases developed severe pharyngeal diphtheria after operation, and death may have resulted
from that complication. A second case was that of a very stout woman with involvement of the right internal iliac vein with considerable exudate. The operation was very difficult and attended with profuse hæmorrhage from the venous plexus at the base of the right broad ligament. The great loss of blood at the operation no doubt contributed to the fatal result, which occurred forty-eight hours after operation. The third death was due to the narcosis, twenty minutes after the operation was begun and just as we had succeeded in excising the right suppurative, thrombotic ovarian vein. The patient had been taking the anaesthetic poorly, and the inexperienced interné crowded the ether until he literally drowned her with it. An autopsy confirmed this conclusion.

In all of these cases in which we removed the uterus, the organ showed marked pathological lesions, justifying the course pursued. These uteri were either studded with miliary abscesses containing streptococci in abundance, or the endometrium was in a condition of gangrene swarming with the same microorganism.

The technique of ligating the pelvic veins, we cannot enter into at the present time. Anyone interested in the subject will find a full description of it with drawings, in an article read by us before the American Gynecological Society in May, 1910, and published in *Surgery, Gynecology, and Obstetrics*, July, 1910.

Before dismissing this topic, let us emphasize that not all cases of septic thrombophlebitis call for surgical intervention. A large percentage of the cases run a fairly mild course and will get well of themselves, and without the development of metastatic abscesses in distant parts, in other words, without developing into a true pyemia.

In what other conditions is hysterectomy indicated? First, all will agree that when a submucous fibroid becomes infected *post partum*, the uterus should be removed. Here the results should be almost as good, if one does not wait until the patient be moribund, as in the operation for ordinary fibroid tumours. We have operated upon four such cases within the past few years, with recovery in all. Secondly, in cases of purulent metritis, that is, when the uterine musculature is studded with abscesses varying in size from that of a millet seed to that of an English walnut. In this group are not included the cases in which a solitary abscess exists in the uterine wall, and when all that is necessary is incising and draining the abscess, or excising it, as we were able to do in two instances.

The diagnosis of purulent metritis has to be made chiefly by
exclusion. There is high fever with up and down excursions which, however, are not as marked as in septic thrombophlebitis. The uterus is much larger than it should be at that period of the puerperium, and is soft and flabby and shows no tendency to contract under stimulation, such as kneading and compression. In addition, there is an absence of physical signs elsewhere; there is no exudate, no enlargement of the adnexa, and no sign of peritonitis.

The general treatment in all forms of puerperal infection is very important, and in very many cases is the only treatment called for. It should consist of providing the patient with physical and mental rest, by drugs, if necessary. An abundance of fresh air, nutritious food in sufficient quantities, and moderate free action of the bowels and other emunctories. Where it is feasible, as in hospitals, the patient should be kept on the roof under suitable arrangements, and given a sun bath for several hours a day. Where a roof is not available, a sun bath can be provided for through the employment of open windows. In cold weather the patient should be protected in the proper manner while exposed to the open air.

Before concluding, we wish to emphasize again that the vast majority of cases will get well, treated on general and conservative principles; that it is only in about, roughly speaking, 10 per cent. of all cases that any surgical intervention comes into consideration; and that in considering surgical measures, no hard and fast lines can be laid down as to indications. Each case must be studied carefully at the bedside and closely watched as to its progress. When feasible, whatever aid is to be obtained from a bacteriological examination of the lochia and of the blood, should be sought and the result duly weighed. Then when all these conditions have been fulfilled and one feels he has the necessary skill and experience, he may be able to save a life here and there, by timely surgical intervention, otherwise it will be safer to rely upon nature's effort with the aid of palliative and supportive treatment.

The subject of puerperal sepsis is so extensive that you will, I am sure, make allowances for our having treated it in a fragmentary fashion. Our aim has been merely to present for discussion a few practical points in diagnosis and treatment.