An Address

ON

PUERPERAL SEPSIS.

Delivered before the Oldham Medical Society.

By PETER HORROCKS, M.D., F.R.C.P.,

Senior Obstetric Physician and Lecturer on Midwifery and Diseases of Women, Guy's Hospital.

No excuse is necessary for selecting the subject of puerperal sepsis, because it is one of ever-present interest to the practitioners of medicine. In spite of all the advances made in our knowledge of disease, and in our knowledge of how to prevent it and how to treat it, every accoucheur is still glad when the third day of the puerperium is over without any rise of temperature.

Looking back in order to see how we compare to-day with the past, no one can read the records without being convinced that there has been a vast improvement, and that this improvement has followed upon the application of modern anti-septic and aseptic principles.

But as I hope to prove to you, we have by no means arrived at a perfect method, and much has to be done, and much can be done, by further minute and conscientious investigation.

A hundred years ago parturition was so often followed by fever of some kind that Nisbet defined pregnancy "as a certain inflammatory disposition of the body, or nearly approaching to it." In those days it was quite the exception for a woman to have a child without some amount of pyrexia during the puerperium. It was looked upon as unavoidable, and due to the great increase in the inflammatory tendency, into which the blood was supposed to get during pregnancy.

In 1676 Willis grouped the different kinds of pyrexia under the term "puerperal fever" a term which is still largely used, although it has been abandoned officially in the *Nomenclature of Diseases* by the Royal College of Physicians. They adopted the term "puerperal septicaemia" and no doubt every case of puerperal fever is due to sepsis of some kind in the blood. But the term puerperal septicaemia embraces several different kinds of fever just as the term puerperal fever did, and yet inasmuch as the Royal College of Physicians made a distinction between puerperal septicaemia and puerperal sapraemia, I thought it best to call my paper puerperal sepsis so as to embrace both kinds. I notice in the latest published work on obstetrics (Webster, 1903) he calls it puerperal infection.

Now, as you know, a woman may become feverish after she has had a child from any cause that will produce fever in a non-puerperal or a non-pregnant woman. Thus she may get any of the ordinary continued fevers such as small-pox, scarlatina, typhoid and the like. She may get influenza, pneumonia, pleurisy, acute tuberculosis and the other well known diseases which cause pyrexia, none of which are included under the term puerperal sepsis. Hence in any given case of fever in childbed it is necessary in the first place to eliminate all possible causes other than those peculiar to that state; in fact to distinguish between fever of the puerperium and fever in the puerperium.

If I am asked what is included under the term puerperal sepsis I should reply that strictly speaking it included the following:

Puerperal fever, or puerperal septicaemia of the worst and generally fatal type.

Puerperal sapraemia which is usually accompanied by an offensive discharge and which is generally recovered from.

Puerperal pelvic cellulitis, also generally recovered from.

Puerperal pelvic peritonitis, non-fatal usually.

Puerperal pyaemia, often a late stage of any of the preceding. Fatality depending on virulence of sepsis.

Phlegmasia dolens. This is now believed by most to be due to sepsis.

Milk fever. Inflammatory; often transient; probably septic; non-fatal.

It would take me beyond the limits of this paper if I were to go into the diagnosis between the different forms of pyrexia of the puerperium, that is, which are peculiar to it, and the forms of pyrexia in the puerperium, that is, which might occur in a non-puerperal or even non-pregnant woman. Nevertheless it is most important to distinguish carefully between the two classes, and it is only human nature to be biassed in favour of calling a puerperal septic case by some such name as influenza, which implies no blame, which involves no necessity for notification, and hence no trouble in the necessary disinfection. I shall tell you later that it is my own practice, and

one which I teach and recommend, to notify any doubtful case as one of puerperal sepsis simply for the protection of others.

If it be not a case no harm is done by notification, whereas great risk of doing harm, and spreading the disease to others, is run by not notifying a doubtful case which proves subsequently to be septic.

About milk fever, phlegmasia dolens, pelvic peritonitis, and cellulitis I shall have very little to say. They are not any of them fatal as a rule, and much of their interest lies in the fact that they may be mistaken for the remaining two, namely, puerperal sapraemia and puerperal septicaemia. The latter is very often, and the former very seldom, fatal. They may occur together, and this mixed form is still more frequently fatal, and is very disappointing to all concerned, inasmuch as it is generally looked upon as a simple sapraemic case, which will get better, but the prognosis unfortunately proves in too many cases quite erroneous.

With your permission, therefore, I shall devote my remarks to these two forms of puerperal sepsis, which include practically what is commonly understood by the term "puerperal fever."

PATHOLOGY.

The study of the history of puerperal sepsis leads you to recognize that in the past it has been attributed to many different causes, and though our predecessors knew nothing about bacteriology they knew a great many clinical facts, and God knows they had plenty of clinical material.

One of the most striking things was the contagiousness of the disease from one woman to another. If a doctor had one case he was very liable to have another or several more. If the woman got the disease in a lying-in institution others in the same institution were almost sure to get it, and sometimes the mortality was so high that the place was decimated and they were obliged to close it.

They thought this dreadful result was caused by vitiation of the atmosphere, hospitalism, and the like, whereas we know now that it was due to actual contagion, the virulent material being conveyed from one woman to another by the hands of the nurse or doctor. In other words, it is not infectious but only contagious.

Numerous examples could be given if it were necessary to prove this never-to-be-forgotten contagiousness of puerperal sepsis. The following case will not only illustrate the contagiousness of puerperal sepsis but will also emphasize the necessity of notification:

I saw a lady in consultation with her doctor, many years ago, and she was suffering from puerperal fever of some sort. At first she was not so very ill, but the signs and symptoms all pointed to the fatal septicaemic type. I advised notification, but the doctor was greatly opposed to it, on the ground that he thought the diagnosis was still doubtful; that perhaps it might be some other form of pyrexia that did not require notification; that, maybe, the patient would get better; that it was such an upset in the house to have everything disinfected, etc.; and that, finally, he was sure the blame would be attached to him of having caused it. Hence he suggested calling it metritis. I did not agree, although no doubt the poor lady had plenty of metritis. I persuaded the doctor to notify the disease as puerperal septicaemia. The lady died about the tenth day of the puerperium. Some three weeks later I met the doctor again in consultation, but not in a puerperal case, and he said, "I feel under a very deep obligation to you for the advice you gave me in that case of puerperal fever," and then he proceeded to tell me the following story.

The nurse who was in attendance was told by the doctor, after I had persuaded him to notify it, that it was a case of puerperal fever, and that he had notified it, and that she herself must when she left the case get thoroughly disinfected before she went to another. As a fact she did nothing of the kind, but went straight to another case with another doctor. This lady developed puerperal fever and died, and the doctor asked the nurse if her last case had done well, and she replied in the affirmative. Inquiring where the last case was she gave him the name and address of the last but one of her cases, which as a fact had done well. He went to this address, and found that the nurse had attended this lady, but he was informed that she had gone from there to attend another patient with Dr. N., giving the name of the doctor who was telling me the story. He came straight on to this doctor and found out the whole truth; the nurse was confronted with this, and was obliged to admit it. I do not know if she was ever punished, but the first doctor said to me

that supposing he had not notified his case of course the nurse would have said she had gone to the other case not knowing that there was any danger, considering that the doctor in attendance had not considered it to be necessary to notify it.

Another well-recognized cause of sepsis of the severe type is erysipelas, and as this disease is now known to be due to a certain microbe, namely, the streptococcus, which is believed to be the cause also of puerperal fever, pathology explains what clinical experience has proved for a long time, namely, that erysipelas is an undoubted cause of puerperal sepsis.

Certain purulent discharges will cause it if the genital organs become contaminated. I do not suppose all purulent discharges are pathogenic, though I do not know of any that would be perfectly safe if they got into the parturient passages of a woman during or just after labour. But I will relate to you the story of one of our externs at Guy's, who, wishing to finish certain appointments in a short time, obtained the post of "dresser in the surgery" at the same time that he was holding the appointment of "extern" in the lying-in department. This latter appointment was for a month, but he was suspended from further attendance upon women in labour, because one of his cases developed puerperal fever. Unfortunately he had already attended a few more cases before the first one became ill, and so before he was suspended. The first case and two others died from puerperal septicaemia. He had been dressing some suppurating wounds in the surgery.

Details of this occurrence will be found in the sixth report of the Guy's Hospital Lying-in Charity which I wrote, and which is published in the *Guy's Hospital Reports* (vol. xlv, 1888). My colleague, Dr. Frederick Taylor, was then Dean of the School, and it was at once decided that in future no extern should hold any other appointment during his term of office.

Of course, as I hope to show in my remarks on prophylactic treatment, it is quite possible for a doctor so long as he takes the proper measures to attend surgical cases and to dress suppurating wounds, and to go on successfully with his midwifery practice, but just now I am merely affording evidence that purulent discharges are a cause of puerperal sepsis.

In connexion with this point is the very important relation which vaginitis—gonorrhoeal or other—in a parturient woman bears to puerperal sepsis. As a fact vulvitis, vaginitis, and urethritis are dangerous conditions for a woman in labour. Every one has seen cases do well in spite of their presence, but in the light that bacteriology has thrown upon all kinds of inflammation and upon the actual cause of puerperal sepsis, the presence of this condition ought to be regarded as dangerous.

The handling of dead bodies is another undoubted cause, whether by the conveyance of ptomaines or of microbes I will not stop to inquire, but the classical story of Semelweis and the medical students in Vienna must come into all your minds. It has been my experience to see many cases of puerperal sepsis in butcher's wives when confined in some room not far from the shop where the dead meat is. With regard to bad smells, bad drains, and bad sanitary conditions generally, I do not think the evidence is quite so good. I am not prepared to say they might not cause puerperal sepsis, but I confess that in most cases of puerperal fever which it is alleged have been caused by a bad drain I find, as a rule, insufficient evidence of a bad drain, and hence I go on investigating to try and find some other and better recognized cause.

The *coup de grâce* has been given to scarlatina as a cause of puerperal sepsis. A parturient woman may become affected with scarlet-fever poison, but it has been shown conclusively that when the poison that produces puerperal sepsis is eliminated the scarlet fever breeds true, and so produces its ordinary well-known effects, which are quite distinct from those of puerperal fever.¹

Stinking discharges as from a diseased bone will also cause puerperal sepsis.

Now all these causes produce the grave, generally fatal, form of puerperal sepsis to which the Royal College of Physicians gave the name of puerperal septicaemia. The condition called puerperal sapraemia is due to the absorption of the products of decomposition.

If a piece of placenta is left behind in the uterine cavity, it generally decomposes and a stinking discharge is the result. The patient is ill, but if the offending piece be removed and the uterus be washed out with some antiseptic lotion, improvement and recovery rapidly follow. The same thing happens if the decomposing stuff is made up of clots, or of

bruised tissues and the same good result is generally observed when proper steps are taken to remove them and to cleanse the parts with antiseptic douches. Hence a stinking discharge is an indication of a tractable form of puerperal sepsis. Sometimes, however, these patients will die in spite of complete clearance of all offending particles and then it becomes a question whether the case is not a mixed form of infection, there being pyrexia due not only to the absorption of products of decomposition (sapraemia) but also pyrexia due to infection by other and more virulent poisons (septicaemia).

According to some, you may have sapraemia in cases even where there is no stinking discharge. In other words that you may have products of decomposition that have no odour offensive to the nostrils. I cannot vouch for this myself though I can quite believe it. At the same time where the lochia are not offensive but scanty, the prognosis is much worse than where they are abundant and offensive.

At all events, I think we may say that puerperal sapraemia is quite a different and distinguishable disease from puerperal septicaemia. Puerperal sapraemia produces pyrexia commensurate with the amount of poison absorbed. The bacteria of decomposition are said not to multiply in living tissues. Puerperal septicaemia is said not to be a specific zymotic disease. I am not sure that it ought not to be included under the same heading as other specific zymotic disease. It is true it has no specific rash, but I think it has a fairly definite incubation of two or three days, and continuous pyrexia averaging seven days.

The microbes that have been found and which are said to be the actual cause of the septicaemia are the streptococcus pyogenes, the staphylococci pyogenes, aureus, albus, and citreus, the bacillus coli communis, which may act by penetrating the bowel wall, particularly during distension, and so infect the peritoneum. The gonococcus and pneumococcus are said to be virulent under certain conditions.

Streptococci have been found in the tissues in so many cases of death from puerperal septicaemia that they are looked upon as by far the most dangerous form of microbe in a puerperal woman. May be many of these differently named microbes are mere varieties of the same germ, and hence it is of no great moment trying to fix upon one particular coccus as being the only cause of puerperal septicaemia.

What I wish to draw your attention to most particularly is the fact that the streptococcus is looked upon as the most usual originator of puerperal sepsis, and that it is one of the most abundantly distributed microbes known. It exists on the hands and indeed on skin everywhere, and can be cultivated from almost any article of clothing, bedding, etc., so that it is extremely difficult to get rid of.

Contrast this with the fact that Krönig in 1894 by very careful investigation found that the vagina was aseptic in all cases of pregnant women not contaminated by digital or instrumental examinations nor by coitus.

Later Krönig introduced germs into the vagina and found that they were speedily killed in two or three days, and that antiseptic douches weakened or destroyed this natural antiseptic action.

Menge confirmed Krönig. These conclusions of Krönig have been disputed, but I think clinical experience shows that the parturient canal (cervix uteri and vagina) are in the vast majority of women either aseptic or at all events without pathogenic germs, so long as the patient is not examined digitally or with instruments.

TREATMENT.

From what has been already stated you will doubtless have gleaned that one of the very best methods of treating a woman in labour in order to prevent puerperal fever is to let her alone.

When you fully realize the causes at work in producing this disease you are not in the least degrees surprised that nearly every woman who had a child in olden times had pyrexia of some sort. Indeed any surprise that one has is that the mortality was not much higher. How women escaped from fatal puerperal sepsis can only be explained on some hypothesis such as that even in those days some accoucheurs were unconsciously aseptic, and that others used not to examine their cases much, if at all. At any rate even they were struck by the fact that women delivered in the gutter, by which was meant, of course, in any out of the way place where no help could be obtained, generally did well. It was not because a gutter, or a ditch, or a barn, were better places for a woman in which to be delivered, but simply because she was alone with nothing but her own natural forces to work

out the labour. There was no examination and consequently no introduction of microbes of any description. Doubtless you have all known of cases where a wretched girl, with absolutely no experience, has crept into some hiding place, such as a barn, to conceal her shame, where, in the dark, without help, without any previous instruction, she has delivered herself of a living child and of the placenta, and has done it so safely that she has been able to get up and leave the child alive and well, and go back to her work in order to try and prevent any one from suspecting that she has had a child at all. Such cases are not so very uncommon, and the point I wish to draw your especial attention is that they almost invariably do well, they very rarely suffer from pyrexia, and this is, I fully believe, because they are never examined or syringed.

Parturition is a physiological act like respiration, defaecation, and micturition, and it requires no assistance whatsoever in the vast majority of cases—namely, in considerably over 90 per cent. So that more than 90 women out of every 100 would deliver themselves safely if they had no assistance whatsoever.

I see cases not infrequently with medical men who tell me they cannot understand how it is that the patient has developed puerperal fever, because everything was perfectly straightforward and they used every antiseptic precaution. And yet the patient is ill, and she is ill with a fever that has been caused by a poison which got into her genital tract at the time of her confinement, and the question arises, where did it come from and how did it get there? The doctor assures me that he is not attending any other puerperal septic case nor any case which could be reasonably supposed would be contagious, and to clinch the matter he may say he has attended one or more other cases since this unfortunate patient was confined and that they are progressing perfectly satisfactorily.

Well in such cases as these it is often difficult to place one's finger on the exact spot and say here is the fault. But I feel strongly that there is a fault, whether one finds it or not, and that it is avoidable. I am convinced that there are cases of puerperal sepsis; both of the non-fatal sapraemic kind, and of the fatal septicaemic kind, that arise from no fault of the doctor, or of the nurse, or indeed of anybody. A woman might suffer from these conditions who had never been examined, or assisted at all by anybody, but who had delivered herself naturally; and in such a case of course the doctor could not be held responsible.

But why is it that in spite of all our increased knowledge of sepsis, of antiseptics, and of the attainment of asepsis, how is it that the mortality from puerperal sepsis is still so high?

My answer to this question is that there is too much interference with the natural course of labour, too much douching and examination of the parturient woman, and that even yet the majority of medical men have not fully realized that on the one hand, in making a vaginal examination of a woman in labour, or just after labour, or doing any manipulative work that may be needful, the process of hand sterilization should be as elaborate as if they were about to do an abdominal section, and on the other that unless they take the greatest care after such hand sterilization they will get the examining finger soiled by germs from their own clothes, the bedclothes, or from the patient herself.

During the evolution of asepsis an effort was made to prevent puerperal fever by the intrauterine douching of every woman as soon as the third stage of labour was over. A solution of perchloride of mercury was used, and it was done so thoroughly that in some cases the patients showed signs of mercurial poisoning. But the results, so far as the prime object was concerned, were grand. For puerperal fever was practically eliminated, and it was believed—and, indeed, it is still so believed even now by some—that it is the proper practice to pursue. It seemed to be a splendid achievement for these lying-in institutions to go from one extreme of such a high mortality that they occasionally had to be closed altogether to the other extreme, when they practically never lost a single case from puerperal sepsis. It was a very natural conclusion to arrive at—namely, that the result was due to this routine uterine syringing immediately after labour. But during the time this experience was being acquired scientific investigations were slowly but surely proving that puerperal septicaemia was caused by microbes introduced into the parturient canal by the hands of those in attendance. The accoucheurs and nurses were therefore beginning to pay especial attention to

the surgical cleanliness of themselves and to make vaginal examinations in the cleanest possible way then known to them. The good results obtained in these lying-in hospitals might therefore be attributed, in part at least, to this increased cleanliness and not solely to the intrauterine douching with germicides. At that time asepsis could not be attained as perfectly as it can be to-day, and no doubt some germs were introduced by the examining finger, and so the perchloride of mercury solution would do good in killing these germs. But obviously, if this be the case, it would be unnecessary to give this intrauterine douche if no germs were introduced, at all events in healthy women. The advocates of intrauterine douching went further, for they syringed the vagina with a lotion before labour, and this I believe is still carried out by some.

Now, when you come to consider, does it not strike you as very odd that this physiological act of parturition should require the washing out of the womb by an antiseptic lotion as soon as the work is done? It certainly would be unique in the whole history of physiology in either the vegetable or animal world so far as I am acquainted with it. As I hope to prove to you, however, this syringing is quite unnecessary, and not only so but is itself fraught with some risk.²

In my own lying-in ward at Guy's Hospital I allow no syringing of the vagina nor of the uterus either before or after labour in ordinary natural cases, which, of course, include the great majority. Unfortunately the reports of all the cases have not been kept, but the obstetric tutor at Guy's Hospital, Mr. Hicks, has kindly taken out of the records for the purpose of this paper notes of all the cases that he could find detailed that were not douched. A small percentage had a slight but transient rise of temperature, only two of them being douched during the pyrexia, but the great majority had a normal puerperium, and the mortality has been *nil*.

I do not think the advocates of routine douching can give better results than these.

Would it, then, not be as well to give up all routine examinations of patients in labour? For the purpose of avoiding puerperal sepsis, I should answer decidedly in the affirmative. An ideal labour is one which is managed entirely by natural efforts. Any puerperal sepsis occurring in such a case could obviously not be due to the introduction of germs from without by the accoucheur or the nurse. It might be due to the introduction of germs from without by the patient herself, for it occasionally happens that a woman during or after labour will for some reason or other introduce her own finger into the vagina, and so carry in, not merely the germs on her finger, but those that lie in and upon the vulva itself.

The custom of examining the patient to find out if everything is going on all right is so universal that it is now done not only by the doctor but sometimes also by the nurse. The advantage of doing it is, of course, that any abnormal condition is at once discovered, and sometimes the failure to find it early in labour would be dangerous to both mother and child. If, however, you will seriously ask yourselves how often such a condition arises without some indication which would lead you to suspect that something was wrong showing the necessity of examination, you must admit that it would be very rare indeed. There is scarcely a single condition requiring help that is not accompanied by some sign or symptom indicating that labour is not normal. Considerably more than 90 per cent. of cases are quite normal. Of the remainder the majority give good evidence of the presence of something that wants seeing to, leaving a very small proportion, where at first there is no sign and no symptom, and yet which could be found out by digital examination.

When you consider the highly absorbent surface of the raw placental site after the third stage of labour, the numerous lacerations in the cervix uteri, vagina, and perineum that are inevitably caused by the delivery of an averaged-sized child, particularly amongst primiparae, in whom puerperal sepsis, probably for this very reason, is commonest, you ought to consider it just as dangerous to put your finger or an instrument into the vagina or uterus as into the peritoneal cavity.

Hence, if you think it wiser to make a vaginal examination when you are called to a woman in labour to find out that everything is progressing satisfactorily, let your examination be undertaken with the same careful precautions as if you were about to put your finger into the peritoneal cavity during an abdominal section. And when you have satisfied yourself that everything is normal, leave it then to Nature and make no further examinations. To make a vaginal examination

during labour (or just after) requires elaborate preparations. The hands should be thoroughly scrubbed with soap and an aseptic nailbrush—for example, a nailbrush boiled and kept in a solution of lysol—in hot water, paying particular attention to the finger nails; they should then be scrubbed with an aseptic nailbrush in a 2 per cent. lysol solution or some similar antiseptic; and, finally, should be placed and kept immersed for not less than two minutes in a solution of perchloride of mercury (1 in 1,000) or of formalin (also 1 in 1,000), or in some equally potent germicidal liquid. Of course there are other ways of attaining a fairly perfect asepsis, but after doing the above I have had my fingers tested on several occasions by our bacteriologist at Guy's Hospital, and he has never been able to discover any streptococci, though he has always by scraping the nail been able to cultivate non-pathogenic staphylococci.

Stich³ says the very best way is not only to disinfect the hand as thoroughly as possible but also to wear an india-rubber glove which can be boiled and made absolutely aseptic. The objection to it is, of course, that it impairs the sense of touch, though I believe now they are made of such thin material that this impairment is very slight. On the other hand when the material is very thin there would be the risk of germs passing through the substance of the glove. Certainly such gloves by being boiled ten minutes can be rendered aseptic, and they might be used for the ordinary routine examination of a woman in labour to find out if all is normal, and if later any operation be required that demand perfect tactile sensibility, then trust may be put in hand sterilization alone without gloves.

The question of trying as far as possible to disinfect the vulva before examination is one of great importance. It is because this is not done at all or done imperfectly that cases arise sometimes where the doctor cannot see how his patient has fallen ill after the care he has taken in all his examinations. Probably he has been as aseptic as was necessary or possible and yet his finger had become contaminated with germs from the vulva just in the act of introducing it into the vagina. In the same way a nurse may be otherwise quite clean surgically and yet in using a syringe she may contaminate the vagina from the vulva. At all events it is a difficult thing to sterilize the vulva, indeed it is practically impossible. But if the nurse is reliable she may be allowed to wash the vulva with soap and water and with some antiseptic lotion.

In making an ordinary examination to find out if labour is going on normally the patient should be on her left side, with the breech at the edge of the bed; then after hand sterilization, with the left one, the right labium majus can be raised, and the wall of the vagina can be seen and its condition noted, particularly the presence of any vaginitis. The right hand can now be taken out of the basin of perchloride of mercury or other antiseptic, and, without allowing it to touch anything *en route*, the right forefinger can be passed into the vagina (held open by the left hand), without even touching any part of the vulva.

If everything is found to be normal, no further examination will be required in nearly all cases. Should anything arise during the course of labour necessitating further examinations then exactly the same precautions should be repeated.

Some advocate shaving the vulva, but I think this would be resented by most patients in an ordinary confinement, and by adopting the above method it is unnecessary; but if things are found to be abnormal and an operation becomes necessary, then I recommend shaving the vulva entirely, or, at all events, the posterior half or as much as comes into the field of operation.

If a nurse or midwife is allowed to examine a case she ought to adopt just the same stringent measures. If I were attending a case I should tell the nurse she must not examine at all. I know some doctors get the nurse to examine and not to send for them until the labour has reached a certain stage, so as to save their time. Such practice is fraught with risk to the patient.

Again, after the child is born, some men always make a vaginal examination to see if there is another child or any lacerations. It is far better not to do so. You can tell by her appearance and by the pulse whether she is losing too much blood. You can even see the red stream flowing over the left thigh, and you know if it is only the usual quantity. You can place your hand on the abdomen and feel by the size of the uterus whether there is another child or not. You need not rub up the uterus to try and get it to contract, even

if it be relaxed, so long as there is no undue haemorrhage. I have shown elsewhere⁴ that this is not only unnecessary but that it interferes with complete retraction. If you adopt the method of expressing the placenta, let it be done entirely from without: and if you twist the membranes into a rope do not pass the finger into the vagina to break this rope off at the os uteri or within the uterus. They will come away clean without much help with a little patience, and, even if some break off, they usually give rise to no trouble, but come away in the lochia. When uncontaminated by pathogenic germs, such bits of membrane are practically innocuous.

The perineum should be carefully examined to see if it be much lacerated, and this can be done by raising the right buttock and the right labium majus with the left hand, and, if need be, drawing the left labium towards the left side with the right hand. Should it be found necessary or advisable to put in sutures, this should be done with just as great aseptic and antiseptic precautions as sewing up the incision after an abdominal operation.

Personally I have not used or recommended a binder for many years. A clean aseptic warm diaper, prepared with some antiseptic or simply sterilized, may be applied to the vulva. No syringing of any kind should be allowed, neither into the uterus nor into the vagina, neither directly after labour, nor soon after, nor during the puerperium at all so long as everything is going on satisfactorily. I find it difficult in practice to prevent nurses syringing; they have been so thoroughly imbued during their training with the necessity for syringing in a routine way that they have come to the conclusion that a woman must have puerperal fever unless she is syringed. I am glad to say, however, that this difficulty is less than it was owing to the spread of further knowledge on the subject.

You will, of course, examine the placenta and membranes to see that all is there, and if you are satisfied there is no need at all to explore the uterine cavity to feel if there be anything left. Placentae succenturiatae are rare, and when they occur you can successfully deal with them later on, and there is nothing else likely to be left if you find the placenta and membranes all right.

So far, I have been discussing the management of normal labour with a view to the prevention of puerperal sepsis. In abnormal labour, where it becomes necessary not merely to make examinations but also to perform operations, manually or instrumentally, or both, everything should be done with as strict aseptic and antiseptic precautions as if it were an intraperitoneal operation. The vulva itself must be as thoroughly disinfected as possible, but for practical purposes the vagina and uterus may be looked upon as already aseptic unless, of course, there be any disease present such as vaginitis. After such operations, if they are carried out aseptically, it is not necessary to douche, though considering that there is no known method of attaining perfect asepsis of one's hands nor of the vulva, it may be justifiable then to use an antiseptic intrauterine vaginal douche immediately after the labour is over with the object of killing any possibly introduced germs.

Again, where it is known that a woman is suffering from a vulvitis, or urethritis, or vaginitis, gonorrhoeal or simple, active measures should be taken to cure this before labour begins; and if labour is already in process when the doctor is called in, and he finds out the inflammatory condition, he should do his best by copious syringing before the child is born to wash away as much as possible. Some say syringing the vagina is very little use, but that it should be wiped all over with swabs, aseptic, and wrung out in some antiseptic lotion. Perfect asepsis of the vaginal walls in such cases cannot be expected, but, at all events, a very large number of the microbes will be removed or rendered *hors de combat*. Syringing in such cases after the labour is over is dangerous owing to the probability of washing the germs into the uterine cavity. Probably swabbing out the vagina through a Sim's speculum would be more efficient and less dangerous, and the vagina even may be packed with iodoform gauze wrung out in formalin 1 in 750, only, owing to the lochial discharge, the gauze must be removed and fresh gauze inserted twice a day during the first day or two, and then once a day until no further required.

When a case of puerperal sepsis arises, the question of how to treat it is, of course, of the highest importance. The first question arises is, Is it a case of sapraemia or of septicaemia? If with pyrexia there be plenty of milk, plenty of lochia, and if the latter be offensive, it is probably sapraemic.

In such a case it is much the best practice to give an anaes-

thetic, and to feel all over the interior of the uterus with the disinfected finger, and to remove any piece of placenta, membrane, clot, or other decomposing matter, and to follow this up by a copious intrauterine douche of some antiseptic, such as perchloride of mercury solution 1 in 1,000, formalin solution 1 in 1,000, or tr. iodi. 3ij ad Oj, in any case using at least a quart, and finally washing out this strong lotion with some milder antiseptic, such as boracic acid lotion or salt and water (3ij ad Oj). This washing out of the uterus should be repeated if the discharge is still foul the next day, or if the temperature remains high.

Some practitioners are content, in a sapraemic case, just to wash out the uterus, without this digital exploration, under an anaesthetic, and no doubt many cases rapidly improve and get quite all right with such simple treatment. But I have seen cases which after all required the uterine exploration, and in which a removable mass of decomposing material was found in the uterus, and in some instances unfortunately it was only discovered *post mortem*.

If the milk is getting scanty or suppressed, if the lochia, too, are diminishing or suppressed, and not offensive, but quite sweet, and the temperature is high, it is probably a grave case of puerperal septicaemia.

In such a case, again, if seen early enough, and of course the doctor knows of the rigor and fever probably soon after they begin, the patient should be put under an anaesthetic and the interior of the uterus should be explored digitally to find out if there be any decomposing mass. Probably nothing will be found. The uterine cavity can be thoroughly syringed with the same lotion as before-mentioned, though unfortunately, as a rule, without the same good result following. In such cases where there is no good effect on the temperature it is often found to be very exhausting to the patient to continue to syringe her, and so it should not be done. Some use glycerine solution, with or without antiseptics like formalin.

I am not at all sure that curetting the uterus is not a good plan, especially if done early, say about the fourth or fifth day of the puerperium. I have done this in several cases with good results, and recommended it as far back as 1890.¹ Of course one gives the patient various antipyretics, such as quinine, antifebrin, antipyrin, and the like, but not one of them is a specific. Some authorities recommend packing the uterine cavity with gauze wrung out in some such strongly germicidal solution as formalin 1 in 500. Webster² recommends crenasol as the best antiseptic to use. It consists of pure creolin minus soda, and is of oily consistence, and is said to kill pathogenic organisms in two minutes.

Of antistreptococcus serum, I have had a large experience, and in some cases it seems to act wonderfully well, but it so often fails that I fear at present one must admit that it is unsatisfactory. Possibly before long a really reliable serum will be obtained which will enable us to snatch these unfortunate patients from the grave danger into which they have got.

In using the serum we give 20 c.cm. at a time injected subcutaneously on the anterior surface of the body, generally the abdomen, with, of course, every aseptic precaution. This should be repeated so that she gets 60 c.cm. within the first 24 hours and then give 20 c.cm. twice a day afterwards. Any wounds in the parturient canal, ruptured perineum, lacerations of the vaginal wall or of the cervix uteri should be made out and carefully washed with antiseptic lotions. Iodoform powder may be dusted on them.

With regard to the removal of the uterus by hysterectomy, vaginal or abdominal, for these cases I have no experience; such a procedure would only be successful, I imagine, when done quite early, and it is precisely in these cases that we cannot tell whether they will be fatal or not. Hence I do not think it is likely to become a recognized practice. The same remarks apply to opening the peritoneum and washing it out and draining it, I have only done it once, but the patient died.

There are two other questions which commonly arise and which have been frequently asked me.

The first one is Should a doctor who gets a case of puerperal septicaemia continue his midwifery practice?

The answer is decidedly in the negative. So long as he is in active attendance on a septic case so long is he dangerous to a woman in labour. Sometimes I am told, Oh, but I am engaged to attend Mrs. B. and she would be greatly annoyed if at the last moment I failed to attend. My advice is to write to her husband and tell him you have a case of blood poisoning on hand, and that it would be highly dangerous for

you to attend his wife, and that he had better have your assistant, or *locum tenens*, or your partner if you have one, or some other doctor. If you do this I am sure you will get no discredit but just the opposite; you will be known as a careful and conscientious doctor.

Think of your own feelings if the case of puerperal septicaemia you were attending died, and the other case developed it and died too. How could you say that you had not conveyed the disease?

There is, however, another alternative and that is to give up attendance on the septic case and place it in other hands and get aseptic in order to go on with midwifery practice.

And this leads me to the second question, namely, How soon after ceasing to attend upon a puerperal septic case is it possible to resume practice? The reply is, in about fifteen to twenty minutes. In other words just as long as it takes to get your hands aseptic. The clothes can be covered over by means of a sterilized overall and the hands can be made aseptic by the method already mentioned.

I have myself digitally explored the uterus of a woman moribund from the most virulent type of puerperal septicaemia and within an hour or two done a Caesarean section, mother and child doing perfectly well.

Of course as a rule a medical man would take longer than this, but please let me say that however long he takes, he must go through the same process with regard to his hands in rendering them aseptic. He must not think that a week or two away from practice will render him aseptic unless he uses the other measures also.

His clothing can be rendered aseptic by sterilization with superheated steam, but in all cases when examining or delivering a woman in labour, he should have his coat off and his shirt sleeves rolled up, and if possible should wear a sterilized overall, certainly in operations; and at other times, when he cannot obtain one, he can cover his clothes with a clean towel, and avoid touching even that.

And now I have done. May be I have spoken somewhat strongly, but, if so, it is because I feel strongly on what I believe to be a prolific cause of puerperal sepsis.

My message to you is to avoid examination as much as ever you can. Whenever you have occasion to examine during or just after labour do it as if it were a peritoneal operation. I know this takes time—not less than fifteen or twenty minutes—to prepare the hands and the patient, and many a time a doctor is too busy. In such a case it is better not to examine at all. Patience is a greater virtue than usual in midwifery practice. Moreover, if you spare this fifteen or twenty minutes to make one satisfactory examination you can if you find everything normal go away quite happy about the result, and you probably will not have to examine again.

Do not allow the nurse to examine. If she has already done so syringe the vagina with a germicidal lotion. Do not allow any syringing before or after labour in ordinary cases. If sepsis occurs attack it with all the weapons at your disposal.

May be you will not agree with all I have said, but I feel sure you will, at all events, allow that I am animated by the same desire as yourself to find out the truth, and to discover if possible a surer way of avoiding puerperal sepsis, and a more certain cure in case it should arise.

REFERENCES.

¹ Boxall, *Obstet. Trans.*, vol. xxx. ² Hottelocks, On Routine Syringing after Labour, *Practitioner*, 1897. ³ *Zeits. f. Geb. u. Gyn.*, Band. xlv. ⁴ No. 1 of the *Journal of Obstetrics and Gynaecology of the British Empire*. ⁵ *Hunterian Society's Transactions for 1890-91*. ⁶ *Op. cit.*

A MEMORIAL has been placed in Glasgow Cathedral to a medical worthy, Dr. Thomas Menzies, who died from an accident some seventy-two years ago. A Highlander from Perthshire, Dr. Menzies studied medicine in Glasgow, and in due course was appointed Lecturer on Surgery at the University of that city. At the same time he carried on a very large practice, having "doctor's shops" as they were then called, in various parts of the city and suburbs, wrote for the *Glasgow Chronicle*, practised hydropathy, began a book on botany, and assisted Chalmers of Free Church fame. His was a strenuous life, and worth recording, for it was full of hard work and constant endeavour; one, too, which ended in somewhat typical fashion, for, though stricken with typhus, he insisted on trying to answer the summons of a poor patient suffering like himself, and in his effort fell down stairs, with results that proved fatal.