

was enucleated, and its bed sewn up with two layers of catgut sutures. The patient made a good recovery, but her pregnancy was interrupted one month after the operation.

In a third case, a primipara aged 25, pregnant about two and a half months, suffering from dysuria and pain in the pelvis, was found to have a fibroid growing from the supravaginal portion of the cervix the size of the fist. As while she was under observation the fibroid rapidly increased in size, and the symptoms became more severe, the tumour was enucleated after opening the posterior cul-de-sac pouch of Douglas. The patient went to term, and was delivered without any complication of a living female child.

The question of operative treatment must be decided on the conditions present in the individual case, and the question of the exact method of dealing with the fibroid must be decided after laparotomy had given access to the tumour itself. He had a previous similar difficulty to that described by Dr. Lockyer on the removal of the placenta in a case of fibroid.

Mr. J. FURNEAUX JORDAN (Birmingham) said that it had fallen to his lot to have to deal with the following cases: A woman six months pregnant with a very large fibroid, weighing over 8 lb. after removal; a case of labour obstructed by a pedunculated subperitoneal fibroid which filled up the pelvis; a case of inversion of the uterus after labour due to a fibroid in the fundus; and a case of a large sloughing submucous fibroid causing profuse, almost fatal, haemorrhage after labour. In all of these the treatment adopted was myomectomy, and in each case a good result followed. In the first two cases there had been a subsequent pregnancy. On this experience he would support his colleague, Mr. Martin, in his advocacy of myomectomy. He would also remind Dr. Giles that the expert gynaecologist was everywhere or almost everywhere; that they did not minimize the gravity of these cases, but realized as the years went by that they were better and better able to treat them safely and satisfactorily without having to resort to hysterectomy.

Dr. MARY SCHARLIEB (President) cordially agreed with Dr. Tate. As a rule, fibroids caused no great difficulty during pregnancy, parturition, or puerperium, but each case must be judged on its own merits. A cervical or intraligamentous growth which would cause obstruction to labour would call for operation, whereas a tumour in the upper part of the uterus would not cause obstruction, and did not offer an indication for operation, unless by its size, or by reason of some accident (such as torsion or degeneration), it was a source of danger. The operation of election was certainly myomectomy, which ought to be preferred to hysterectomy, unless the uterus were infected, or so riddled with fibroids as to be a useless organ and a source of danger. She had performed myomectomy on several pregnant women, sometimes for symptoms due to degeneration of the growth, and once for a fibroid which coexisted with an ovarian dermoid and pregnancy. The two growths were removed. The patient was safely delivered at term of a living child.

Dr. TATE, in reply, said he was gratified to find that he had the support of nearly all the speakers in the remarks he had made in opening the discussion. In reply to Dr. Spencer, he thought that in a few cases the pain caused by fibroids was sometimes so severe that operative interference became necessary. Dr. Tate did not agree with Dr. Martin that the fibroid in his case was the cause of the uncontrollable vomiting owing to the tumour interfering with the expansion of the uterus. If this were so, why did not the tumour cause vomiting in the subsequent pregnancy?

THE ORIGIN AND PREVENTION OF PUERPERAL FEVER.

By Professor D. DÖRRLIN,
Munich.

OF the large number of the factors in puerperal infection two stand out with ever greater clearness: these are the danger of (1) infection from within the female generative organs themselves, and (2) inoculation by pathogenic organisms from without during labour or the puerperium.

As for the former, the flora of the vagina afford extensive protection against virulent infection, at least during

pregnancy, during normal labour, and also during the early and most dangerous period of the puerperium. Only one definite micro-organism has its natural habitat here—the *Bacillus vaginalis*, which was first described by me, and which plays the important rôle of preventing the development of other micro-organisms, especially those of a pathogenic kind, by the production of lactic acid. This circumstance must be our guide in treatment. If we find abnormal conditions of the flora in the vagina during pregnancy we should try to favour the propagation of these normal inhabitants of the vagina.

Measures for the disinfection of the internal organs of generation at the time of birth are, however, much more important than the prophylactic measures to be taken during pregnancy. On this very contradictory views are held. While on the one hand some aim at avoiding danger of infection by special measures of disinfection—irrigation and rubbing the vagina with disinfecting substances—others maintain that such measures are of no advantage, and that Nature has surrounded the physiological act of birth with all necessary protection. In favour of this latter opinion—which I also hold—are the results of the bacteriological examinations of the secretion of the female genitalia, which show that the antagonistic relations of the bacteria to each other afford the simplest and best means of combating this autochthonic danger of infection.

Practical experience also favours this natural method of treatment of normal parturition, though statistical evidence on the point must be examined with care if false conclusions are not to be drawn.

The comparison of clinics employing fundamentally different methods of treatment may easily lead us astray. Different results do not authorize the conclusion that the cause for these differences lies in special principles of treatment. Conditions in different hospitals vary too much for general conclusions to be formed from single measures.

Whether prophylactic treatment of the genitalia of the parturient woman is advantageous, or, on the contrary, even injurious, can only be decided by comparing the results of different methods at one and the same hospital and during the same period.

I have at different times made such investigations in my clinics at Tübingen and Munich. Alternately one parturient was disinfected and the other not, so that there were always at the same time lying-in women of both classes together in the hospital who had been confined at the same time, and in other respects than that of vaginal disinfection under exactly the same conditions. The results in the Tübingen clinic, published by Baisch,¹ covered 500 births, during which the parturient women were irrigated with 1 litre of sublimate solution, 1 in 1,000. During the irrigation the walls of the vagina were rubbed with two fingers of a gloved hand carefully and cautiously, but still as thoroughly as possible. As all internal examinations of these women were made exclusively with a gloved hand, and the external genitalia were previously disinfected, the introduction of microbes from without was excluded.

In the same period there were 500 lying-in women not subjected to vaginal disinfection. Of the 500 disinfected women, 12.8 per cent. had fever, while of the 500 not disinfected, only 8 per cent. had fever. After deducting those who had fever not originating from the genitalia, there remained 5.2 per cent. with fever among the non-disinfected and 10 per cent. among the disinfected.

The investigations recently made in the Munich Lying-in Hospital in the same way, and published by Eisenreich,² furnished similar results. We used here an irrigation of $\frac{1}{2}$ to 1 per cent. solution of lactic acid. The results showed that, of 460 parturient women disinfected therewith, 6.29 had fever, while of 477 not irrigated, only 3.5 per cent. had fever.

Thus, in both series of observations the disinfected women were twice as badly off as those who were not disinfected. These results force us to the conclusion that the disinfection of the internal organs, by whatever means carried out, is not only of no use, but rather causes injury.

If we had not the theoretical bacteriological investigations of the flora of the female genitalia, these clinical results would be extremely puzzling, as being opposed to all our fundamental views of antiseptics. But, as things are, they are readily explicable.

The protective action of the natural flora of the vagina is disturbed by the disinfection. Moreover, as the result of the energetic and repeated disinfection with watery solutions, the secretions of the genitalia are removed, the vagina becomes dry and its epithelium swollen. The probability of the mucous membrane being abraded during birth, and thereby more exposed to invasion of bacteria, is consequently increased. But however matters be explained, the fact remains that when the flora are disturbed by disinfective measures, the chances of parturition remaining entirely physiological are decreased. As for infection from without, the irrigation tubes or other instruments introduced into the genitalia during labour may contain microbes which have remained on them from former use. If such instruments have been recently used on infected cases, and have not since been sterilized, the danger is obvious, but it is so easy to prevent this that the risk only need be mentioned.

It is much more difficult to prevent the danger from the examining hand. This danger was discovered and proclaimed by Semmelweis, and though his views were at first disputed, it is now fully established that he was right; in other words, the examining hand is the principal source of infection of parturient women, and serious cases of puerperal fever are caused almost entirely in this way.

There are two ways available of avoiding this danger—either to give up the internal examination of the parturient woman entirely, or so to prepare the examining hand that it can carry no poison into the genitalia. It has long ago been shown by numerous clinical observations what an advantage lying-in women have when their internal examination can be and is avoided.

By developing methods of external examination it might be possible to render the establishment of a complete diagnosis so far possible that internal examination might be prohibited altogether; but, though the danger of infection would thus be reduced to a minimum, faulty diagnosis would so frequently occur that the renewed introduction of internal examination would again take place as the lesser of two evils.

It is all the more fortunate, therefore, that a means exists of making the internal examinations which are necessary for a proper diagnosis without incurring danger of infection.

Different hands vary in the extent to which they can be disinfected, but many investigations have shown that no hand whatever can be completely freed from all organisms, whatever the labour and care taken.

In my opinion, therefore, reliance should not be placed on hand disinfection, and we should make it a routine practice to conduct all vaginal examinations with a gloved hand.

In making such examinations gloves are not liable to be torn and infected fingers exposed as they may be during operations, and the manufacture of very thin gloves does away with the objection against their use, that the sense of touch is diminished and the examination thereby made more difficult. It requires only very slight practice, and we have been fully convinced in the case of the numerous students in our hospital, as well as of those studying midwifery, that they can feel just as well as without gloves. The difficulty that midwives experience in putting on thin gloves I have endeavoured to eliminate by constructing a two-fingered examination glove, which protects the examining fingers in the ordinary way and the rest of the hand by a kind of mitten. With this simplification, which renders it perfectly easy to put on, the cost is also reduced and that further objection to their use done away with. These two-fingered "touching" gloves* are disinfected in the wholesale manufactory by streaming superheated steam and then packed in a triple cover, impervious to air and bacteria, in a way directed by me. I think that no valid objection can now be made to the universal use of this very important means of preventing the danger of internal examinations.

If we avoid too refined measures of disinfection on the one hand, and on the other deprive the necessary vaginal examinations of their danger, for which purpose the use of the touching glove is not only the simplest, but also the surest means, the result everywhere, in the statistics of

all countries, must be to reduce the morbidity and mortality of puerperal fever to a minimum.

REFERENCES.

¹ *Arch. f. Gyn.*, Bd. lxxix, p. 325. ² *Zentralbl. f. Gyn.*, 1910, vol. v, p. 14.

DISCUSSION.

Dr. BALLANTYNE (Edinburgh) agreed with Professor Döderlein in practically all the remarks he had made, and followed, with one or two exceptions, the methods he had recommended. The difficulty which had always faced him was the almost absolute impossibility of applying *all* aseptic precautions in the serious cases of midwifery—for example, third stage hæmorrhage, and the risk of leaving out essential protective details. So it often came about that obstetricians took the most complete precautions in the cases that needed them least, and ran the risk of omitting them in the cases in which they were most essential. He would counsel the young obstetrician not to feel that because there was no time to fulfil the whole aseptic technique he could omit all precautions. He regarded the use of rubber gloves to extract pieces of membrane as very difficult.

Dr. PURSLOW (Birmingham) had used gloves for operative midwifery, and found that there was no difficulty, except in cases of removal of adherent placenta. He believed British obstetricians were generally agreed that preliminary disinfection of the vagina in midwifery cases was unnecessary, but there was disagreement as to the advisability of preliminary cleansing of the vagina before performing Caesarean section. Personally, he did not consider it necessary, unless there had been preceding vaginal manipulation. The textbooks written for midwives did not draw sufficient attention to the extreme importance of keeping their hands, as far as possible, from contact with infectious matter in their daily work, and the midwives formed the idea that contact with all forms of organic and inorganic matter was equally dangerous.

Dr. HERMAN (London) quoted Dr. Kocher's operative surgery to the effect that the use of india-rubber gloves to the surgeon was to wear them when he was not operating. The expense was prohibitive to the poor midwife. The very best results had been attained without gloves.

Mr. S. G. KIRKBY-GOMES (Straits Settlements) said that in the East, where his own work lay, asepsis was even more difficult to obtain than in this country, and consequently gloves were largely used both in surgical and obstetric work. Much of his own success in both directions he could attribute to the use of gloves. He had not experienced the mechanical difficulty reported by those who spoke against the use of gloves in surgical practice, and firmly believed that with a little practice nobody else should either. Gloves, he thought, should be worn in all surgical procedure put into practice by surgeons, obstetricians, and gynaecologists alike.

Dr. FREDERICK EDGE (Wolverhampton) said that it was in the third stage that infection was most commonly incurred. This failure in the management of the after-labour stage was due to over-anxiety about shreds of placenta and membranes being left in the uterus, and consequent unnecessary interference with the uterine cavity. The greatest reluctance to interfere with the uterine cavity should be strongly inculcated by teachers. Meddlesome douching, and especially douching with inadequate cleansing of the vagina and vulva, should be specially forbidden. If the uterine cavity had to be entered, the procedure should be carried out as carefully as an abdominal section.

Dr. HASTINGS TWEEDY (Dublin) said that there was no operation in obstetrics and gynaecology that could not be performed with rubber gloves. The most adherent placenta could thus be removed, and to facilitate this, finger-tips could be cut away, and the bare tips painted with "new skin." If the glove were filled with methylated spirit, it slipped on to the hand with great ease. The spirit hardened the epithelium, and prevented the maceration of skin, therefore it was a mistake to suppose

* To be had of Zieger and Wiegand, Rubber Manufacturers, Folkmarisdorf, Leipzig, Kirchstrasse.

that a glove must contain or did contain pools of septic fluid. Some complained that spirit blistered the skin, but the blistering was due to the incomplete removal of the antiseptic by spirit before the hand was placed in gloves.

Dr. BLAIR BELL (Liverpool) said he was sorry that a discussion on puerperal infection should resolve itself into a discussion of the advantages and supposed disadvantages of rubber gloves. The question had passed beyond a matter of judgement or opinion. The surgeon and obstetrician who did not wear them was exposing his patients to unjustifiable risks, and could not possess an aseptic conscience. If there were difficulty in removing an adherent placenta it could be overcome by putting a sterilized cotton glove over the rubber one. He called attention to the fact that surgeons were not nearly particular enough about the cleanliness of their hands in everyday life. No surgeon should do gardening or clean motor cars with uncovered hands. Further, he thought the habit of wearing leather gloves week by week an extremely dirty one—every one was more particular about his foot-wear. Personally he always wore white washable cotton gloves which he had had specially made. Such details of personal cleanliness should come natural (aseptic conscience) to the aseptic surgeon.

The PRESIDENT (Mrs. Scharlieb) said it was pleasant to learn that Professor Döderlein disapproved of the so-called preliminary disinfection of the birth passages, because in England it was believed that antiseptic douches or gauze scrubbing of the vagina were likely to do more harm than good. His suggestion of the limitation, but not the abandonment, of internal examinations, and the wearing by the obstetrician of india-rubber gloves, or, in the case of midwives, of a special form of protection for the half-hand, seemed to her wise. Several speakers had enlarged on the difficulty of removing scraps of placenta and fragments of membrane when wearing gloves—a trouble which others thought to remedy by wearing a sterilized cotton glove over the rubber. She did not think this difficulty was very great, especially if a roughened variety of glove were worn. It seemed advisable that when the whole hand had to be introduced into the uterus the glove should reach up to the elbow. Some speakers feared that the wearing of rubber gloves would tend to cause carelessness in the disinfection of the hands, but surely hands should be disinfected as carefully as if gloves were not going to be worn, and the gloves should be worn as if no attempt to cleanse the skin had been made. The suggestion of filling the gloves with methylated spirit to ensure their sterilization and to facilitate the introduction of the hands would certainly not suit all skins, and if the obstetrician got his hands sore or rough there was an end to the possibility of surgical cleanliness for some days to come. Probably glycerine that had been boiled was a safer lubricant.

ADDITIONAL CASES OF RUPTURE OF THE UTERUS.

By J. M. MUNRO KERR, M.D.,

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THIS short communication has special reference to three additional cases of rupture of the uterus upon which I have operated during the last two years. In the *Journal of Obstetrics and Gynaecology of the British Empire* in July, 1908, I recorded 14 cases. In that paper I referred in considerable detail to the symptomatology of the condition. On the present occasion, however, I shall only refer to the treatment.

CASE I.

Mrs. F., aged 37 years, 4-para, was admitted to my ward in the Glasgow Maternity Hospital on March 31st, 1909. Her first three children were born without difficulty. She was seen by the house-surgeon twenty-four hours after labour had started. Forceps had been tried, but failed. On her arrival at the hospital she was in a collapsed state. The vagina was full of blood clot; the fetal limbs could be palpated easily on one side of the abdomen and the uterus on the other. When the abdomen was opened, it was found that the head was still in the uterus and the trunk free in the abdominal cavity. There was difficulty in getting the child's head through the rent in the uterus. Complete hysterectomy was performed, and the left parametrium

drained per vaginam by means of gauze and tube drain. The patient made an excellent recovery. The child weighed 12½ lb.

CASE II.

Mrs. S., 7-para, admitted on October 10th, 1909, in a very collapsed state. The child's body was born, but the head remained above the pelvic brim. Several futile attempts at delivery were made. When sent into hospital, it was recognized that the head was hydrocephalic. The head was therefore perforated and easily extracted. The child had spina bifida. After the birth of the child the hand was passed into the uterus to remove the placenta, and a tear was discovered, extending up the whole of the left side. The abdomen was opened, and an incomplete tear discovered; the peritoneum was intact. The abdomen was closed and the tear packed with gauze per vaginam. The patient died in five hours.

CASE III.

Mrs. R., aged 38 years, multipara, was admitted into hospital in a collapsed condition. The child had been in the transverse position, with arm prolapsed and shoulder impacted. Internal version attempted before admission. On examination a large mass was found on the left side of the abdomen, and in front and to the right of it another less movable one could be palpated. Per vaginam, the vagina was full of blood, and no fetal parts could be felt. Abdomen opened. A large complete tear, involving cervix and lower uterine segment, and extending to the insertion of tube, was discovered. Hysterectomy; left parametrium drained. The patient made an excellent recovery.

REMARKS.

It is a matter of great satisfaction that the results obtained from operative treatment have greatly improved in recent years. Since my paper dealing with fourteen cases which I had treated appeared, the most valuable contribution in English on the subject is Eden's paper read before the Royal Society of Medicine on May 13th of last year. Eden strongly supported operative treatment, and in the three cases he detailed was able to record two recoveries. There is little doubt that in the slighter degrees of incomplete rupture plugging still gives the best results, but in the severe cases of complete rupture abdominal section is pretty generally admitted to be better. Some really very brilliant results have been obtained in recent years by such treatment, as will be seen by consulting the table compiled by Petró of Lund.¹

The majority of cases of rupture of the uterus operated upon by abdominal section, which die, die of sepsis, not of shock. Taking my own cases, I have performed hysterectomy 11 times with 5 recoveries—that is to say, a mortality of 55 per cent. Now of the 6 fatal cases, 4 died of sepsis and 2 from shock.

Putting aside the cases of slight incomplete rupture, let us consider only the graver forms of rupture and the most satisfactory methods of dealing with them. Since I commenced to perform abdominal section for such cases my results have steadily improved. The first 6 I tried by supravaginal amputation, and with that treatment I had 4 deaths—a mortality of 66 per cent. In these 6 cases I was struck by the fact that 3 of them died, not of shock but of sepsis. I therefore determined to try and improve my operative treatment so as to lessen this. Thinking the matter over, it appeared to me unsound to leave behind the cervix, the part of the uterus that in many cases was probably chiefly infected by the operative procedures and examinations that had taken place prior to the rupture. I therefore determined to remove the cervix. In this way I treated 3 cases, but still had 2 deaths—exactly the same percentage as with supravaginal amputation. I therefore thought I should go a step further, and, in addition to removing the cervix, that I would drain the lacerated broad ligament and completely cover the lower part of the pelvis with peritoneum. My last 2 cases I have treated in this way, and both of them have recovered. The drain used has been a thick rubber tube brought out through the vagina and loosely surrounded with gauze. I am in the habit of leaving this drain in for three or four days. As far as my experience goes, this is the treatment I have found most satisfactory.

REFERENCE.

¹ *Monats. f. Geb. u. Gyn.*, Bd. 29, Heft 3, 1909.

AIR EMBOLISM DURING LABOUR.

By JOHN CAMPBELL, M.A., M.D., F.R.C.S. Eng., LL.D.,
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Air embolism probably occurs more frequently during labour than is commonly supposed. Very little attention is paid to it in most of the ordinary textbooks, and the