pulseless it may be advisable to improve the general condition before submitting her to the additional strain of a laparotomy, but if this line of treatment is to be followed the patient must be in a hospital or nursing home, and under constant observation, as she may have to be taken to the operating theatre immediately should there be any indication of further haemorrhage.

The particular operation performed will depend on the type of case and the condition of the patient. In serious cases nothing more should be done than is actually required to save the patient's life, and this generally means excision of the affected tube with or without the corresponding ovary. No time need be lost in attempting to clear the peritoneal cavity of all blood clot. When the case is sub-acute, and the pelvic organs are disorganized or the seat of an old infective lesion, it is quite justifiable to remove both appendages or even the uterus.

Some advocates of conservative surgery have urged that the gravid tube should be saved whenever possible, but this view has not received general support. The danger of another pregnancy occurring in the same tube is probably not a remote one, so most operators prefer to err on the safe side and remove it. A second ectopic gestation not uncommonly occurs in the remaining tube, and there are those who would guard against this accident by always removing both tubes when operating for tubal pregnancy. This is going too far in the other direction, since many of the patients have normal pregnancies subsequently if the non-gravid tube be left intact.

The operations are carried out abdominally, the only exceptions being those rare cases in which a pelvic haematocoele has become infected. In such an event the correct line of treatment is to open the posterior fornix and evacuate the infected clot. One of my own patients in whom this operation was performed subsequently became pregnant and was delivered of a healthy child.

The operations performed in my series of cases were as follows:

Unilateral salpingectomy	10 cases.
Unilateral salpingo-oophorectomy	55 "
Double salpingo-oophorectomy	8 "
Subtotal hysterectomy with removal of both appendages	30 "
Posterior colpotomy (for infected haematocoele)	2 "

RESULTS.

The prognosis in cases submitted to operation is good, and the earlier operation is performed the better the results. I know of no disease of parallel severity where the response to prompt surgical treatment is so rapid or so satisfactory. There are, no doubt, many patients who die before surgical treatment is available, but the number of these cases will become smaller as the symptoms and signs antecedent to rupture become more generally recognized. There were no deaths in my series, and this I must attribute to good fortune, though it bears out what I have said about the remarkable powers of recovery which these patients display after operation.

In conclusion, I will add a few words about the question of subsequent pregnancies.

Excluding those operated upon less than six months before the date of my investigation, there were 53 cases where subsequent pregnancy was possible; 14 could not be traced, which reduces the number to 39. Of these 46 per cent. had a subsequent uterine pregnancy, and 13 per cent. a second ectopic pregnancy. In 41 per cent. there was no further pregnancy.

The figures show that the prognosis as regards subsequent uterine pregnancies is fairly good, but that there is a very definite risk of the patient getting a second ectopic pregnancy. As a matter of fact 7 of the 100 patients in my series had two ectopic gestations, and in 5 of them I performed both operations myself. In these 5 cases the non-gravid tube was apparently healthy at the time of the first operation.

DISCUSSION.

Miss MABEL L. RAMSAY (Plymouth) related her experience of a case of undoubted ectopic pregnancy for which no operation was performed. At the necropsy, fifteen years later, there was no sign of pelvic disease.

Dr. LEITH MURRAY (Liverpool) questioned the high incidence of tubal rupture in Dr. Dougal's series. In his own series of 110 cases he had only found 7 cases of undoubted pathological rupture of the tube. He agreed that the great majority of cases were associated with pelvic disease in one form or another, but in quite a number of cases trouble could be traced to the appendix; hence on every occasion when operating for this condition he removed the appendix when reasonably accessible.

Dr. BETHEL SOLOMONS (Dublin) referred to the biochemical tests which had been introduced to aid in the differential diagnosis. Cases of ectopic pregnancy had very frequently to be judged by their general appearance only. In undoubted cases of tubal rupture he was strongly against moving the patient, preferring to operate, if need be, on a cottage table.

Dr. FARQUHAR MURRAY (Newcastle) said that in many cases all the signs were referred to the upper abdomen, so that a diagnosis of ruptured ulcer or biliary trouble might be made. In the early acute stages no blood could be detected in Douglas's pouch by vaginal examination alone, but only by combined rectal and vaginal examination. He thought that many patients were operated upon too hastily; a wonderful improvement often resulted if a short period was given to allow recovery from the shock of being moved.

Mr. FORDYCE (Edinburgh) said that there was one type of case which was apt to be overlooked—namely, rupture into the broad ligament. He had seen this several times, and it was frequently mistaken for the retroflexed gravid uterus, since the symptoms might be the same. He emphasized the need for the very greatest care in examining a case of suspected ectopic pregnancy; rough handling might produce disastrous consequences.

Professor R. J. JOHNSTONE (Belfast) laid stress on the extreme tenderness felt on examination in the posterior fornix, and regarded this as a valuable aid in diagnosis.

Dr. HAIG FERGUSON (Edinburgh) commented on the importance of obtaining an early diagnosis. In his experience the mistake was not infrequently made of diagnosing these cases as ordinary abortions.

Dr. DOUGAL, in reply, said that he might have over-estimated the number of tubal ruptures, but he did not think he had. He had had no experience with biochemical tests in distinguishing these cases from those of pelvic infection. He had seen a number of cases where pain had been referred to the upper abdomen. He agreed as to the dangers of rough examination.

COMPOUND COMMINUTED FRACTURE OF TIBIA AND FIBULA INVOLVING THE ANKLE- JOINT TREATED BY THE "BIPP METHOD."

A CASE REPORTED BY MONICA BELL, M.B., B.S.DURH.,
HUMSHAUGH-ON-TYNE,

With Remarks by

RUTHERFORD MORISON, F.R.C.S.,

EMERITUS PROFESSOR OF SURGERY, DURHAM UNIVERSITY SCHOOL
OF MEDICINE, NEWCASTLE-ON-TYNE.

A GROOM, aged 30, was admitted to Hexham War Memorial Hospital on June 24th, 1927. Three hours before, while cycling on the road, he was crushed against a wall by a motor car, and the near wheel of the car went over his right leg. He could see that his right foot was turned completely round, and that the bones of the leg were sticking out through his torn clothing, and that there was a large wound. He took hold of his foot by the heel and toes and replaced the bones as well as he could.

CLINICAL NOTE BY DR. MONICA BELL.

Condition on Admission.

He was a thin, fragile-looking man, and was suffering from severe shock. After x-ray examination he was taken to the operating theatre, anaesthetized with open ether by Dr. Hurley, and operated upon by Dr. Fairclough.

Two large wounds smeared with dirt and motor oil were seen on the inner and outer sides of the lower third of the leg and ankle-joint. After enlarging these wounds several fragments of the tibia, lying completely detached, were removed, and a considerable tag of soiled, hopelessly lacerated muscle, hanging out of the inner wound, was excised. The upper cartilaginous surface of the astragalus was visible through the widely opened ankle-joint. A few small bleeding vessels were ligatured, the wounds, treated by the bipp method, were sutured by silkworm-gut sutures, and the leg was fixed between two lateral Gooch splints, extending from the tubercle of the tibia above to the sole of the foot below.

After-Progress.

The symptoms of shock soon disappeared after he was put to bed, and his leg felt comfortably free from pain. After the second night pulse and temperature remained normal, he felt well, no discharge appeared through the dressings, and they were left unchanged for ten days. Then the wounds were found to be healed, except where a small tag of muscle had been left projecting from the inner wound, uncovered by skin. The sutures were all removed. The small granulating wound over exposed muscle dried up without showing any sign of infection, and the scab separated in three weeks. From this time his recovery was uninterrupted.

REMARKS BY PROFESSOR RUTHERFORD MORISON.

I saw this patient at the request of Dr. Monica Bell, to whom I am indebted for notes of the case, three months after the accident described. She wished to be advised when it would be safe to allow her patient to begin to walk. He had been getting about on crutches and undergoing massage treatment. There was still some swelling of his ankle, but the fracture result was excellent and the scars sound. Movements of the ankle-joint were limited to about half of the normal, but were steadily improving. He is now doing his work with the help of a calliper, to be used for about three months.

During the war I proved that with the aid of suitable antiseptics infected wounds could be safely closed, and that it was possible to obtain "healing by first intention" in many of them. This was to me a new and surprising discovery, as it was to many of the visitors who came to see our work in the Northumberland War Hospital. It also confirms my belief that the greatest advance in surgery depends upon the discovery of new and more efficient germicides, just as the treatment of syphilis did.

The general practitioner is in danger of losing acquaintance with Lister's principles of wound treatment and their application by the use of antiseptics, because aseptic methods are now used to the exclusion of everything else in all hospitals. With a trained staff and fully equipped service such ideal aims are justified by results, but they never will be in ordinary everyday surgical work, and patients have to pay the penalty for lack of this knowledge of the use of antiseptics.

The *Bipp Method of Treatment of War Wounds*, published by the Oxford Press (price 2s. 6d.), describes fully our practice.* Numerous papers from others as well as by myself have described the remarkable results achieved, of which the case recorded is a good example.

The only explanation I can offer as to why this method has not been adopted universally is that cases of poisoning, occasionally fatal, have followed it. From the first I pointed out the risk of poisoning by absorption of the medicaments, and a few of our early cases developed illness the symptoms of which I fully described. Of my later cases, after we had learned a better technique, none were ill, but an exceptional one showed the blue gum line characteristic of bismuth absorption. Of the hundreds of cases treated in the Northumberland War Hospital by my colleagues and myself none died of bipp poisoning. The only criticism possible is that our directions had not been followed with the necessary care in fatal cases. Few alterations have been made in our method, and the latest directions are:

1. Under an anaesthetic, usually open ether, cover the wound with gauze wrung out of 1 in 20 carbolic acid, and thoroughly clean the skin and the surrounding area with

* The mode of preparation of the paste is as follows: Iodoform 16 oz., bismuth subnitrate 8 oz., liquid paraffin 8 fl. oz., or a sufficient quantity. The powders are mixed together in a clean mortar, and the liquid paraffin incorporated. The quantity of liquid paraffin required varies according to the bulk of the powders, the bismuth in particular being liable to a considerable variation in bulk. A sufficient quantity should be added to form a thick paste. It is then advisable to rub down the paste in small quantities at a time, on a slab with a spatula, to ensure freedom from grit and other particles of powder. This paste is not specially sterilized.

the same lotion. (Preliminary washing, by causing swelling of the epidermic cells, prevents penetration of the carbolic solution, and so does harm.) Drape the surroundings with towels wrung out of 1 in 20 carbolic acid, and soak gloves and instruments in the same.

2. Open the wound freely, and if possible sufficiently to permit of inspection of its cavity. A guide—a finger is the best if the size of the opening permits of it, and, if not, a thick probe—should be introduced to the bottom of the wound, and held there until fully exposed. In doing this special regard must be paid to nerve trunks and muscular branches of nerves, since the division of blood vessels, excepting the largest, and of muscles themselves does little harm as compared with that of the disability following nerve damage. Cleanse the cavity with dry sterile gauze mops, Volkmann's spoon, etc., and remove all dead tissues and foreign bodies.

3. Mop the surrounding skin and the wound cavity with methylated spirit, and dry it.

4. Fill up the wound with bipp, and rub it well in with dry gauze (clean hands and rubber gloves are, of course, understood). Then remove all excess, leaving only a thin smear covering over the wounded surfaces. (In bones special care should be taken to remove bipp from all surfaces and crevices, as excess may result in non-union of fractures.) Dress the wound with a strip of gauze wrung out of spirit. Sprinkle the surrounding skin with sterile boric acid powder, and cover all with an absorbent pad. This dressing requires no change for days or weeks if the patient is free from pain or constitutional disturbance. If bloody discharge comes through, the stained part may be soaked in spirit, and a gauze dressing wrung out of the same applied as a further covering, or re-dressing is very easily done. After removal of the old dressing the wound is covered with a dossil of wool soaked in spirit, and any discharge is wiped off the surrounding skin till it is clean. A dressing like the first is then reapplied when necessary.

Bipp should never be used as a "salve." Rubbed on cracks, squeezed into sinuses, spread over septic ulcers, it may cause an acute septic "flare-up"—a dangerous and disconcerting result of treatment.

GAS IN THE PERITONEAL CAVITY.

BY

W. McADAM ECCLES, M.S., F.R.C.S.,
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THE peritoneal cavity in the male is a closed sac. Into this cavity there is secreted or excreted normally a small quantity of serous fluid which serves mainly as a lubricant. Gas in the space is an alien. The peritoneal cavity in the female is not closed to the atmosphere, for air can theoretically pass through the vulval outlet into the vaginal passage, up through the cervical canal, the cavity of the body of the uterus, along a Fallopian tube, and so at its fimbriated end into the cavity of the peritoneum.

That it may actually do so may be surmised by the fact that air will enter, by suction, the vaginal space when the female is in the genu-pectoral position and the labia are separated. Further "inspiration" may cause it to travel along the rest of the female genital tract, and reach the peritoneal cavity. If it does it will act as a foreign substance, and may even cause some collapse by its irritating effect upon the sensory nerve fibres in the parietal peritoneum. This is possibly the reason why severe pain is felt when the wall of the uterus is perforated by a sharp instrument in criminal abortion. To put it briefly, the tract along which spermatozoa travel is also open to liquids and gases.

Gastric Gas in the Peritoneal Cavity.

Gastric is the type of gas which is most commonly met with in the peritoneal cavity. Perforation of the stomach wall, or the wall of the duodenum, by the corroding action of an ulcer, is the usual way in which the passage of this gas occurs. Again the entrance of the gas—accompanied, it is true, by irritating fluid—into the cavity is followed by intense pain, so that the patient cannot take a deep breath, and holds the abdominal muscles rigid. The free gas may