permanganate was poured into the cavity, which had been thoroughly curetted to remove the pyogenic lining. The powder was pushed into every crevice with a piece of cotton on a forceps and with the finger, and some gangrenous skin and cellular tissue removed with scissors, and the wound was packed with a strip of gauze. It was left alone for a few days, during which the man rapidly improved, and when the wound was washed out there was a healthy pink granulating surface, but almost dry. At the end of ten days he was out and about.

Mencièr's Method of Embalming.

One of the greatest pleasures of my stay in France was that of assisting Mencièr at these operations at the Hôpital de la Compassion. I may describe one of the many cases I saw with him.

A young farmer from the south of France was shot through the ankle by a rough piece of cast steel shrapnel. Pieces of his shoe and sock were carried through and left there, although the steel went through. As he had been standing in the same wet and dirty socks for weeks in the trenches the wound was badly infected. The tibia, fibula, and scaphoid were shattered into many fragments, some living, but most of them dead. One collection of pus formed after another, and the poor fellow was so exhausted with pain and suppuration that he continually begged to have his leg removed. No sooner was one abscess opened and drained than another formed, so that at one time there were four drainage tubes traversing the joint at various angles. Mencièr thought the leg might be saved, and the man was transferred to his hospital for operation. The operation was done very quickly under spinal anaesthesia. A tourniquet was applied around the thigh, so that it was bloodless. The antiseptic precautions were perfect. The operator made a 9-inch incision, which was held open by powerful retractors while he removed the suppurating fragments and curetted the cavity with a sharp spoon. With a cold chisel and mallet he cut away the ragged ends of the tibia, fibula, and tarsus. When he had finished there was a cavity which more than held 8 oz. Mackintosh was fastened to the edges of the skin, and the cavity after being thoroughly dried was filled with pure carbolic acid, which remained there one minute by the watch. This was removed with swabs of cotton, and then the cavity was irrigated with 5 to 7 pints of strong alcohol. Again the cavity was dried and then irrigated with the embalming fluid, consisting of alcohol, ether, iodoform, guaiacol, eucalyptol, and balsam of Peru. The ether acts as a vehicle to carry the antiseptic substances into every corner. After this a permanent dressing was applied, consisting of strips of gauze soaked in solution A, which is ten times stronger than solution B. This dressing is removed twice daily for seven days. The phenolized wound, which appears whitish directly after the carbolic acid is applied, becomes once more red under the influence of the lavage with alcohol. Next day the wound looks more or less blackened with the acid, but it is dry and clean and has lost the nauseous characteristic odour of gas gangrene.

Mencièr claims that most antiseptics act only on the surface, while phenolization acts in the depths of the tissues where the *Bacillus perfringens* becomes harmful.

I can testify to the fact that Mencièr saved many limbs by his method. It is easy to learn and carry out, although rather expensive on account of the large quantity of ether used. Whether we could not obtain equally good results by the deep disinfection of wounds by potassium permanganate, either in powder or in strong solution, I am not prepared to say.

Ulcers and Burns.

Great improvement in the healing of large ulcers or wounds of the feet and legs can be obtained by raising the foot of the bed on two chairs or blocks, so that the wound will be absolutely higher than the patient's nose. Zinc oxide ointment on oilcloth, not oilsilk, but cheap white table oilcloth, is the best treatment for extensive burns such as we had a great many of, due to the explosion of bombs a few feet distant. Some of the men had their trousers burnt off them. Boracic acid causes great pain and should never be employed, and Carron oil does well; but what is wanted is something thick enough to exclude air, alkaline in reaction, and oily. It must not be spread on lint unless put on very thickly and backed up by oilcloth or jaconet. As lard becomes rancid and intensely acid, it should never be used for ointments; vaseline is cheaper, keeps for ever, and is always bland. I gave all these cases an anodyne the moment they entered the ward, and thus saved them much of the shock generally seen. When these large destructions of dermis occur near a joint it is important to resort to skin grafting on a large scale to avoid cicatricial contraction. Many joints were kept efficient by keeping a weight on until the grafted skin had replaced the destroyed

tissue. I removed strips of skin 4 in. long from the outside of the thighs under an anaesthetic, and stitched them across the centre of the large areas under great aseptic precautions, and on removing the dressing a week later was gratified to see that they were firmly adherent. From each of these strips the skinning over process proceeded rapidly, and in another week the weight was taken off, and there was no tendency to retract. I saw some cases where a good man was lost to the service by retraction of his legs, from burns behind the knees, without weights or skin grafting being used. But they did not occur at Lady Wemyss Hospital.

Heart Surgery.

The most striking experience of my stay in France was while visiting the Hôpital du Panthéon, where I witnessed the removal of a bullet from the pericardium behind the heart by Dr. d'Ardennois. In fifteen minutes the skin and muscle over the heart had been incised and lifted up; the ribs nipped through and lifted up on their joint with the sternum; the heart lifted out of the pericardium, all the time throbbing so strongly as to knock the operator's hand away when he tried to catch it; the bullet found, caught, and wriggled out of its bed; the heart put back, ribs sewed together, muscles readjusted, and skin closed carefully. A lady doctor, herself a doctor's wife, assisted, and the accuracy of the x-ray picture in front and profile showed where the bullet was to a nicety.

As a rule we received our cases the same day that they were wounded. But this was not always the case; sometimes, for various reasons, we did not receive them for a week. Many of these were deep, clean cuts, gaping widely, granulating, and bathed with pus. In these cases it was our invariable rule to thoroughly cleanse them with hydrogen peroxide, which cleanses without harming the granulations, and then to pass a silkworm-gut stitch far back from the edge of the wound and a quarter of an inch under it, and so to embrace the whole raw surface in a series of deep loops. When these were tied, the granulating surfaces were brought firmly together. No bad results followed. There was a little suppuration without temperature, because we drained with a few strands of silkworm-gut at the bottom. The country was saved at least two weeks' loss of each man so treated, for in a few days, or a week at most, the wound was healed, instead of taking a month to fill in with granulations.

FAECAL AND INTESTINAL VOMITING AND JEJUNOSTOMY.

By VICTOR BONNEY, M.S., M.D., B.Sc.LOND.,
F.R.C.S., M.R.C.P.,

ASSISTANT Gynaecological Surgeon to the MIDDLESEX HOSPITAL,
AND SURGEON IN CHARGE OF ITS MILITARY BRANCH AT
CLACTON-ON-SEA: SURGEON TO THE CHELSEA
HOSPITAL FOR WOMEN, ETC.

The obstruction was released, but the vomiting never stopped, and the patient died twenty-four hours later.—*Case Report, any Hospital.*

The abdominal distension continued to increase, the patient vomited large quantities of brownish fluid, and the pulse became uncountable.—*Another Case Report, any Hospital.*

In November, 1910, a paper of mine appeared in the *Archives of the Middlesex Hospital* (vol. xxi), entitled "Post-operative paralytic obstruction of the intestine, with special reference to its treatment by jejunostomy." Therein I pointed out that the fatal result in these cases was due to toxic absorption from the upper intestinal tract brought about by an acute ascending infection by *B. coli communis* and other organisms of the lower intestine in a state of exalted virulence and activity.

I further pointed out that in these cases the bowel may be divided into three segments, each of which is in a different condition: (1) A collapsed portion, (2) a portion above it much distended with gas, but containing no fluid matter, and (3) a portion above that distended with gas and fluid matter, the fluid being more or less faeculent in character and identical with that vomited.

I showed that in these cases it was proper to open the upper fluid-containing segment in order to drain the

reservoir of toxicity, and useless to open the middle gas-containing segment.

During the time that has since elapsed my confidence in the correctness of the views then expressed has been strengthened, and I hold strongly that in all cases of paralytic intestinal obstruction (whether primary, or secondary to an organic obstruction or to peritonitis), when advanced to the stage of faecal, or short of faecal, intestinal vomiting, should be treated by jejunostomy.

The Character of the Vomit as Indicating the Condition of the Upper Intestinal Tract.

The character of the vomited matter indicates the condition of the upper part of the intestinal tract, for where the vomit is faecal or intestinal the stomach forms the highest part of the fluid-containing segment. This upper segment does not necessarily reach as high in every case of intestinal obstruction when it first comes under clinical observation, nor need it at first include any part of the small intestine; for if the primary obstruction is situated low down in the large intestine, the total area of distension may not at first extend above the ileo-caecal valve. In such the "segment of toxicity" will comprise the caecum and descending colon. In this phase, however, the vomit is neither faecal nor intestinal, but simply the stomach contents.

In all cases of obstruction, however, the stomach and jejunum will eventually be included in the fluid-containing segment, and so soon as this occurs the fact is made patent by the change in the character of the vomit, which at first becomes intestinal and finally faecal.

This upward extension of the limits of the fluid-containing segment is due to a rapid upwardly extending infection of the canal by organisms of the lower intestine.

The effect of an infection by faecal bacteria on the contents of the small intestine is well illustrated by the following case:

A soldier was sent to the military branch of the Middlesex Hospital at Clacton-on-Sea. He had been kicked by a horse and intestine had been ruptured. Immediate laparotomy was performed, and the bowel anastomosed by means of a Murphy's button. When the man went to Clacton, four weeks afterwards, the button was still *in situ*, and could be well seen with the x-rays. The abdominal wound presented a fistula from which typical faecal matter, characteristic in odour and non-irritating to the skin, exuded. Two weeks later, the button not having passed and the man being very ill with signs of intraperitoneal suppuration, I operated.

I found to my surprise that the faecal fistula led down to a coil of small intestine some 3 ft. above the point where the button was lodged, which itself was some 3 ft. or more from the ileo-caecal junction. The button was half in and half outside the bowel, the wall of which at the point was in a state of necrosis, and surrounded by a large pelvic abscess. I excised two portions of the gut and performed a double anastomosis, and the man made a fortunate recovery.

The interest of the case from the point of view of this paper is that the presence of the necrotic area in the vicinity of the button had induced an ascending infection, which extended at least 3 ft. above it, and which converted the odourless ichorous contents of the ileum into a stercoraceous, non-ichorous material, identical with that normally found in the large intestine.

This conversion by bacterial agency of the normal contents of the small intestine into a highly toxic fluid is the essential factor in the production of the symptoms of acute intestinal obstruction. The presence of the toxic substances in the bowel excites the mucosa to exude a copious watery secretion which, mingling with the infected fluid already there, itself undergoes corruption. Thus the upper intestinal tract becomes converted into a great toxic reservoir.

The death of the patient is due to the absorption of this toxic material, and the vomiting is Nature's desperate attempt to rid the organism of the poison.

It is here that surgery should step in and drain the reservoir.

The drainage opening must tap the fluid-containing segment. It is useless to open the segment that lies below it; nothing escapes, and I have on several occasions seen a patient die with great distension and vomiting faecal matter to the last, whilst through a free opening into the caecum or ileum not a drop of fluid, not even a puff of gas came!

On the Place of Caecostomy.

Caecostomy is a most effective operation in those cases in which the caecum and ascending colon form the fluid-containing segment; but it is not indicated when the vomit is faecal or copiously intestinal—that is, when the "segment of toxicity" includes the upper intestinal tract.

Jejunostomy.

By making an opening into the jejunum in a case of faecal or intestinal vomiting the source of the vomit is directly tapped and free drainage of the toxic material is established.

No patient should be allowed to die with faecal vomiting if it is possible to perform this operation. Its effect in my cases has been remarkable; in all of them there has been immediate cessation of the vomiting, and all the patients have recovered.

It is true that after jejunostomy a second operation to close the opening has to be faced, but this is not such a serious undertaking as might at first be thought.

Mr. Sampson Handley, in his paper recently published in this JOURNAL, refers to my original paper on the subject, but doubts whether jejunostomy would be successful in cases of post-operative intestinal paralysis. The cases I am now able to report show that it is most successful. Its object is *drainage*, to which all else for the moment must be subservient. There is no fear that jejunostomy will starve the patient of water. Once the vomiting is stopped, the stomach alone is quite capable of absorbing all the water required, and more can be given by the rectum or under the skin.

Mr. Handley suggests instead short-circuiting the jejunum to the transverse colon and then performing caecostomy. Inasmuch as he opens the jejunum, he does actually perform a jejunostomy, the difference from my procedure being that the jejunum drains through a segment of the colon instead of directly through the abdominal wall.

Which of these two channels of drainage will prove to be the best, experience alone can show. Certainly jejunostomy is the shorter and easier operation, and, in view of the septic condition of the bowel, I opine the safer.

TECHNIQUE OF THE OPERATIONS.

The First Operation.

The abdominal incision should be separate from that made to relieve the obstruction. The latter will usually be in the mid-line below the umbilicus. It may have been primarily made there on account of the obstruction or have been made through the scar of the recent operation that preceded the obstructive symptoms. By making a separate incision for the jejunostomy the healing by first intention of the far larger wound below it will not be jeopardized. An opening about 2 in. long, directly above the umbilicus, having been made, the *highest obtainable coil of jejunum* is pulled up. In most cases the coil immediately below the duodeno-jejunal junction may be deliberately selected; but if there be great distension this may be impossible, and the surgeon must then take at random one of the coils lying in the left hypochondrium. The intestine is fixed in the wound by two stout sutures passed through the skin, then through the thickness of the bowel wall, and then out through the skin again at either end of the wound. The intestine is now opened by a small longitudinal incision, the edges of which on either side are sutured to the skin edges of the abdominal wound with a few stout sutures.

On opening the bowel a quantity of gas escapes, and there may be at once a gush of faeculent fluid, but sometimes the latter does not begin to pour out till a little time has elapsed.

Though the fluid must be highly infective, it does not seem to affect the wound to a marked degree, neither does it interfere with the healing of the second wound if such be present.

It might also be supposed, in view of the loose suturing of the intestine to the edges of the wound, that there would be considerable danger of infection spreading to the peritoneum, but in not one of my cases has this occurred.

Subsequent Progress.

During the next twenty-four hours a copious discharge takes place identical with the fluid the patient was vomiting before the operation. After this, as the intestine clears itself, the discharge becomes thinner and odourless, and increasingly bile-stained until it consists of the normal jejunal contents. At the end of a week, or sooner, undigested food particles appear, and the skin in the vicinity of the opening becomes very red and excoriated. The patient rapidly wastes, and it is now time to consider the closure of the opening.

During this period the treatment should be as follows: For the first forty-eight hours nothing but water should be given by the mouth, to which brandy or whisky may be added as required. The amount of water given should not be stinted. After this the patient should be given easily absorbable meat essences and extracts, freely and at short intervals. It is no use giving food substances which require jejunal digestion, like milk, for instance, which is merely passed in clots out of the jejunal opening. Rectal saline infusions with glucose added should also be given every four or six hours. If the patient's condition is very bad continuous infusion of saline solution into the thighs is the best of all restoratives. Brandy may be added in the proportion of 1 oz. to a quart. For the discharge frequent changing of the dressings is required, and the skin should be protected by smearing it with a thick mixture of castor oil and oxide of zinc.

The Second Operation.

At the end of a week or ten days closure of the jejunal opening has to be undertaken. As by this time the skin is very red and excoriated around the opening, the preparation of the operation area should be limited to the application of iodine solution on the table. It is no use attempting a paring operation, the whole opening must be removed, the bowel sutured end to end, and the abdominal wound separately closed. The skin incision should begin $1\frac{1}{2}$ in. above the opening, and continue downwards until the opening is nearly reached. It should then bifurcate to surround the opening $\frac{1}{2}$ in. outside the muco-cutaneous junction and unite again below it. The peritoneal cavity should now be opened *above* the adherent bowel, and a finger inserted to make out the limit of its deep attachment. Guided by this finger the bowel is entirely freed, bringing away with it that part of the abdominal wall included in the oval area demarcated by the skin incision. The freed coil having been brought up, a clamp is applied to the intestine on each side of the opening, and about two inches from it, so as prevent the escape of the contents. Sterile towels are now packed round the coil so as to exclude the wound edges and the peritoneum and the previously attached portion is cut away down to the mesenteric attachment. An end-to-end anastomosis is then performed with three layers of sutures for extra security. The bowel is dropped back and the wound in the parietes closed with a single layer of stout sutures.

For the first forty-eight hours after the closure it is better to restrict the patients to water by the mouth, but this may be given freely. Afterwards, and up to the end of the first week, the diet should be limited to easily-absorbable meat extracts and essences.

Report of Cases.

I give below short details of six cases of jejunostomy, five of my own (all I have performed) and one of my colleague's, Mr. Bryden Glendining, which he has very kindly given me leave to publish.

CASE I.

Paralytic obstruction of the last 3 ft. of the ileum and of the caecum and ascending colon forty-eight hours after radical removal of carcinoma of the cervix. Faecal vomiting. Jejunostomy was performed with immediate relief. Jejunal opening closed about a week later. Recovery.

CASE II.

A case in which an ovarian dermoid was forced through the wall of the rectum above the floor of Douglas's pouch by the child's head during labour. Primary operation thirty-six hours later; general peritonitis. It being impossible to suture the bowel, the uterus and broad ligaments were sutured to the back of the pelvis, so as to exclude that cavity. Enormous distension and faecal vomiting. Jejunostomy performed two days later

with immediate relief. Jejunal opening closed about a week later. Recovery.

CASE III.

General peritonitis due to a suppurative ovarian cyst. Cyst removed. Obstructive symptoms appeared with faecal vomiting. Jejunostomy with immediate relief. Jejunal opening closed some days later. Recovery.

CASE IV.

Operation for extrauterine gestation. Patient became distended. Mr. Handley in my absence reopened the wound. Patient greatly relieved for two days. Symptoms of acute obstruction then became manifest, with copious intestinal vomiting. I reopened the wound, and found enormous distension of the upper part of the small intestine. Jejunostomy with immediate relief. Jejunal opening closed a week later. Recovery.

CASE V.

Patient had been operated on for papilliferous ovarian cyst two years before. Admitted for intestinal obstruction and faecal vomiting. Scar reopened; many adhesions and great distension found. Jejunostomy with immediate relief. Jejunal opening closed a week later. Recovery.

CASE VI (Mr. Glendining).

Operation for suppurative disease of the uterine appendages. Seventeen days later wound reopened for further collections of pus in the pelvis. Abdominal distension increased, with faecal vomiting and signs of obstruction. Five days later jejunostomy. Stomach washed out and 1 pint of liquid paraffin poured into the bowel. Six days later excision of piece of jejunum and anastomosis. Recovery.

REFERENCE.

¹ BRITISH MEDICAL JOURNAL, April 8th, 1916.

A CASE OF MARKED TEMPORARY APHASIA AFTER LIGATURE OF THE COMMON CAROTID ARTERY FOR TRAUMATIC ANEURYSM.

By FRANK COLE MADDEN, M.D. MELB., F.R.C.S. ENG.,
PROFESSOR OF SURGERY, EGYPTIAN GOVERNMENT SCHOOL
OF MEDICINE; SENIOR SURGEON, KASR-EL-AINY
HOSPITAL, CAIRO.

DURING the year 1915 we treated upwards of 5,000 sick and wounded soldiers—British, Australian, and Turkish—in Kasr-el-Ainy; but with all the chances of damage in many cases of bullet wounds we had only one case of obvious penetration of the large vessels of the neck.

This case, which unfortunately ended fatally, reached us many days after the infliction of the wound, and was that of a British soldier with a bullet which had passed through the upper jaw on the right side, then through the soft palate and side of the pharynx and on down the neck in front of the sterno-mastoid. An x-ray photograph showed the bullet lying in front of the body of the sixth cervical vertebra rather to the right side. A well-marked pulsating swelling was present over the carotid artery, on which we proposed operating when the general condition had improved. Our hands were forced, however, owing to the occurrence of repeated disquieting secondary haemorrhages from the wound in the pharynx. On the advice and with the kind assistance of the late Colonel Stonham, consulting surgeon to the forces, I cut down in the neck and found a very extensive slitting of the internal jugular vein, pouring blood into a very thin-walled pouch, only very imperfectly delimited from the surrounding tissues. There was no injury to the arteries of the neck. Though we were able to secure the divided ends of the vein, the shock and haemorrhage at the operation were too great to be borne by an already very enfeebled patient, and he died shortly after the operation.

It remained for our civil patients, who were once again admitted to the hospital after the stress of wounded had passed, to furnish us with a much more perfect case of combined injury to artery and vein in the neck, which, for several reasons, is worth placing on record.

History and Condition on Admission.

He was a young Egyptian carpenter, aged 23, named Mustapha Aly, admitted on February 15th, 1916. He stated that he had been stabbed in the left side of the neck with a chisel three days before. At the time there had been considerable haemorrhage, which had soon stopped. Very shortly after the blow he noticed a swelling at the site of the wound, which induced him to apply for advice. The external wound was situated over the middle of the left sterno-mastoid, and had almost quite healed, but a large pulsating swelling occupied the space