TABLE IV.—Effect of Iodargol. (Six Guinea-pigs, each weighing 340 grams.)

Toxin Injected.	Iodine Injection after 3 Hours.	Day 1 after Inoculation.		Day 2.	Day 3.	Day 4.
		9 a.m.	3 p.m.			
Oct. 27, 1915. 1 M.L.D. 2.15 p.m.	Control; no iodine	— No iodine		t	+	
" "	0.25 c.cm.	— 0.25 c.cm.	0.25 c.cm.	t	tt	+
" "	0.5 c.cm.	— 0.5 c.cm.	0.5 c.cm.	t	+	
" "	0.75 c.cm.	fill	+			
Nov. 5, 1915. 1 M.L.D. 11 a.m.	1.0 c.cm.	— 1.0 c.cm.	1.0 c.cm.	t	+	
	5.0 c.cm.	— No iodine			tt	+

There is little doubt that iodargol had no favourable influence upon the course of the disease.

In other experiments injections of "colloidal" iodine were given before and three hours after the toxin without any beneficial results.

Further, we tested the effect of a preparation of iodine and soluble starch which neutralized tetanus toxin *in vitro*, but it proved quite ineffective as a curative agent. On one occasion the animals did survive, but this result seemed mostly accidental, for the injections were inadvertently made too close together, and the swelling caused by the injection of toxin joined to that due to the iodine, and thus the latter may have come into direct contact with the toxin before it was absorbed. When this experiment was repeated, care being taken to place the injections far enough apart to prevent direct mixing, the result was death of both the animals.

CONCLUSION.

We are forced to come to the disappointing conclusion that iodine injected subcutaneously has no effect upon tetanus toxin which has been also injected subcutaneously in a different place.

We cannot, therefore, hope to influence favourably the course of an attack of tetanus by injections of iodine alone, nor does iodine appear to have any effect in enhancing the power of serum.

It would seem, then, that iodine can only be of use when applied to the infected focus, so that it can come into direct contact with the toxin before absorption.

REFERENCE.

¹ *Lancet*, 1915, i, p. 430.

THREE CASES OF ABDOMINAL GROWTHS PRESENTING VERY UNUSUAL CHARACTERS.

By CHARLES A. MORTON, F.R.C.S.,

PROFESSOR OF SURGERY, UNIVERSITY OF BRISTOL; SENIOR SURGEON TO THE GENERAL HOSPITAL, AND THE CHILDREN'S HOSPITAL.

CASE I.—Tumour Composed of many Hydatid Cysts Growing within the Abdomen, and Protruding into an Umbilical Hernia so as to form a Large Pendulous Growth.

A WOMAN, S. H., aged 39, was admitted to the General Hospital in April, 1914, with a very hard, heavy, lobulated

FIG. 1.

mass protruding at the umbilicus (Fig. 1). There were some round elastic nodules on its surface. The umbilicus

was lying on it, and it was sent to the hospital as an umbilical hernia. It measured 7 in. by 6½ in. When the patient stood up it hung down (as shown in Fig. 2) so far that the upper surface came as low as the pubes. Because it was so heavy it dragged down the abdominal wall in a funnel-shaped form with it. She always had to support it when her bowels acted. A number of firm round nodules could be felt extending from it, up under the abdominal wall. It was clearly not a simple umbilical hernia, but some form of growth, perhaps extending into the sac of an umbilical hernia, but the nature of the growth was not suspected.

FIG. 2.

At the operation on April 14th I found there was an umbilical hernia, and that a very thick mass of omentum passed out of the abdomen into it. To the distal end of this, lying in the hernia, a large lobulated tumour was attached. The abdomen was full of cysts, some quite small and others the size of duck's eggs. They occupied every part from the pelvis to the diaphragm, some lying under the stomach. I was able to divide the omentum, connecting the colon and the cysts within the abdomen with the umbilical tumour, and then removed the tumour mass with the overlying skin, and brought the edges of the umbilical opening together by the overlapping method. The umbilical tumour weighed 3 lb. 8 oz., and was composed of a number of the same kind of cysts as those within the abdomen, fused together. I found they were typical hydatid cysts. The patient made a good recovery, and returned to South Wales. In answer to a letter of inquiry as to her present condition sent last July, the only information she supplied, with regard to her abdominal condition, is contained in these words: "I am getting on all right, and don't feel no ill effects in the stomach."

CASE II.—Sarcoma of the Small Intestine causing Recurrent Attacks of Obstruction.

A woman, R. S., aged 44, was sent to me at the General Hospital in October, 1914, by Dr. Graham, of Watchet, with recurrent attacks of abdominal pain. She had the first attack two years before I saw her, the second one year before. For sometime before I saw her she had been getting the attacks every few days. In April she had a very severe one, lasting several days, and requiring hypodermic injections of morphine. All the attacks, even the one two years before I saw her, were of the same character; the pain was either just at the umbilicus or close to it, and was usually most severe at the umbilicus. It was of a gripping character, and after lasting some hours she generally vomited, and then the pain either diminished or ceased. She said she was generally distended when in pain. She suffered from habitual constipation, but for some time she had had no action of the bowels without aperients or enemata. The vomit was bile, and there was no history of either haematemesis or melaena. For a month before I saw her she had been on liquid diet only, with the exception of a small quantity of bread, but had had severe attacks every few days. When she had been taking ordinary diet the attack used to come on two or three hours after dinner.

On admission there was nothing abnormal to be made out in the abdomen, but when seen in an attack of pain I found considerable distension in the lower abdomen, and once I could make out a distended coil. I thought the attacks were due to intestinal obstruction, probably from adhesions. I operated on October 20th, and found the obstruction due to a growth in the small intestine. The coil containing the growth was lying quite free in the pelvis. It must have been about the middle of the small

intestine, for after tracing the gut in each direction from it I failed to arrive at either the caecum or the duodeno-jejunal junction. The bowel on the proximal side was greatly dilated and thickened. The growth was hard and at parts leucoplakic in appearance, and was spreading into the mesentery. It resembled a very large reel, for it was constricted in the centre and had a kind of rim where the bowel wall joined it, just such a rim as one makes on tying the rubber tube on a Paul's intestinal glass tube. It occupied $2\frac{1}{2}$ in. of the bowel and was 2 in. in thickness. There were no secondary growths in the liver, nor any glands in the pancreatic region, but there were a few quite small glands clustered together at the root of the mesentery corresponding to the growth, and a few in the mesentery between these and the growth. Those lying quite close to the growth were removed with it, but microscopic section, made at a later date, did not show any growth in them. I resected the growth, together with 3 in. of the intestine above and below it, and united the ends, and then brought the united bowel through the opening in the parietal peritoneum, the edges of which I united to it, so as to exclude it from the general peritoneal cavity in case of leakage. This, of course, prevented my uniting the deep abdominal wall in the part corresponding to the protrusion of the united bowel, and she will have to guard against extension of the ventral hernia thus produced, by a belt; but by fixing the united bowel in this way outside the peritoneal cavity the serious danger of the operation—that is, leakage from the junction—was avoided. I put a drainage tube by the side of the bowel. There was never any leakage, and she made a good recovery, but during the first few days after the operation she had attacks of abdominal pain, evidently due to obstructed passage of intestinal contents through the united portion of bowel.

The growth was semitranslucent, white and firm, and at its junction with bowel lumen protruded into it like the os uteri into the vagina. The lumen through the growth was so greatly narrowed that only a small pair of

FIG. 3.—This figure shows the interior of the bowel, which has been laid open by a longitudinal cut extending also through the growth, and is spread open. The difference in size of the bowel on the proximal and distal sides of the growth is well shown in the illustration.

artery forceps could be passed through it (see Fig. 3). Microscopical section of several parts of the growth showed round celled sarcoma.

CASE III.—*Malignant Growth of the Colon causing Obstruction, and Associated with Phthisis in a Young Man of 21.*

H. W. was sent to me on October 26th, 1914, at the General Hospital, by the late Dr. Eglington of Street. He had had pain in the left side of the lower abdomen and in the epigastrium for two months, and a small lump had been observed in the left lower abdomen. He had been in a sanatorium for some time, but a week before I saw him

his bowels had ceased to act and he began to vomit, and he was then sent home from the sanatorium to the care of Dr. Eglington at Street. He had had repeated enemata without effect, and the abdomen became distended, and during the twenty-four hours before admission the abdominal pain became very severe. On admission there was considerable abdominal distension, and a small hard lump about the size of a finger-tip could be felt in the left lower abdomen, just above the middle of Poupart's ligament. It was fixed, but fairly superficial. There was a distended coil in the right lower abdomen. No swelling could be made out on rectal examination. There were no physical signs of disease in the chest. The pain had ceased, and he did not vomit. He was fed on albumin water, and had several hot turpentine enemata, and as a result of these he passed a considerable amount of flatus, and the pain did not recur to any extent, nor did he vomit. The distension considerably diminished, and the lump in the left lower abdomen became more distinct. As, however, by the 30th no faecal action had been obtained, I felt obliged to operate. I expected to find—what had been diagnosed before admission—a tuberculous lesion causing the obstruction.

On October 30th I made an incision through the middle of the left rectus, low down. There was a little clear serum in the peritoneum. Two inches of the iliac colon were converted into a hard, smooth cylinder, with a white scar-like appearance of the peritoneum covering it. There were a few yellow nodules on it, and a thickening of the fatty tissue attached to it. It was movable on the floor of the iliac fossa, and the surrounding structures were not adherent to it. It was not at all like a constricting carcinoma. The yellow nodules on it were not like caseating tubercle; they were more of a golden colour, and may have been altered fat. I could not decide whether the lesion was tuberculous or new growth. I could easily have excised it, and should have done so but for the additional disease present. This consisted of hard nodules attached to the transverse colon, and the parietal peritoneum about the head of the caecum. I could not very well reach the liver, but felt no nodules on it, and there were no enlarged glands. I anastomosed the ileum to the pelvic colon. The descending colon was much thickened, but not greatly dilated. During his recovery from the operation he began to cough, and physical signs of effusion appeared at the right base, and an exploring syringe discovered pus there. During this time he had moderate evening pyrexia, and rapidly lost flesh. He had no recurrence of the intestinal obstruction, but had some incontinence of faeces. On November 22nd, having withdrawn an exploring syringe barrel of pus from the chest, I endeavoured to evacuate the pus, but opened into a small shut-off space in the pleura, and could not get the exploring syringe through this into any collection of pus. He died the next day. It was not obvious at the operation why I did not open into the empyema, from which I had just withdrawn the pus; but the necropsy showed that at the exploration the needle had passed through a space of unaffected pleura which had been shut off by localized adhesions and a thin layer of collapsed lung, and into this space I unfortunately opened at the operation, and failed to reach the pus again by the exploring needle passed from it in various directions.

The necropsy also showed that there was extensive breaking down tuberculous disease of the base of the lung, on the side of the empyema, and tubercles were scattered throughout both lungs. In the abdomen were some breaking down nodules on the mesocolon of the transverse colon, and many nodules in the omentum, but no general tuberculous of the peritoneum, nor any peritonitis, except that old adhesions were present around the anastomosis; and there was not as much as an ounce of fluid in the peritoneal cavity, and this was clear serum. The lumen of the iliac colon was so reduced that I could not pass my little finger through it. The enlargement of this portion of the iliac colon seemed to be due to great thickening of the coats, and the edge was well defined. Both the muscle coat and the mucous membrane were each one-third of an inch in thickness. The thickened mucous membrane formed an irregular raised edge at its junction with the healthy bowel, and here the mucous membrane was puckered. The surface was not ulcerated but smooth, but not as smooth as healthy mucous membrane. There

were no enlarged glands. Professor Walker Hall investigated the nature of the lesion, and has been good enough to allow me to publish his report, which is as follows :

The mass consists of carcinomatous tissues.

The submucous, muscular, and subperitoneal tissues are invaded by glandular cells arranged atypically.

In places the infiltration is so marked that individual bundles of muscle fibres are separated by masses of cancer cells.

The cells themselves show colloid degeneration, and this process is general throughout the specimen.

There is evidence of spread by lymphatic vessels.

BLOODLESS OPERATION FOR HAEMORRHOIDS AND PROLAPSUS ANI.

BY MAJOR F. McKELVEY BELL, M.D.,

SURGEON TO — CANADIAN STATIONARY HOSPITAL, FRANCE, AND ST. LUKE'S GENERAL HOSPITAL, OTTAWA, CANADA.

THE operation here described is intended for cases in which four or more large piles occur or in the milder grades of prolapsus ani. In other words, it may be used in any case in which Whitehead's operation is indicated, but has the advantages of being almost bloodless and less liable to complications.

The usual preparation is given by mild laxatives and a light diet for two days previous to operation, *ol. ricini* ʒj and no supper the evening before, and two to three simple enemata—that is, sufficient to clean the colon—in the morning. The instruments required are one large slightly-curved clamp, two Hagedorn needles, one semi-curved needle, one pair of scissors curved on the flat, tissue forceps, thermo-cautery, and No. 4 silk for suture.

Operation.—After dilatation of the sphincter, a long silk suture is passed through at the junction of the skin and mucous membrane in the mid-perineal line (Fig. 1). This suture is to be left untied and used as a retractor (1), two similar sutures are inserted on either side of the anus (2 and 3), so that when traction is made upon all three

FIG. 1.

the extruded mucous membrane is converted into a triangle.

Each side of the triangle is to be dealt with individually. The portion between 1 and 2 is clamped in order to mark the area for excision. This area is limited externally by the junction of the skin and mucous membrane, and extends internally to within one-eighth inch of the required depth. On removal of the clamp a bluish furrow will be seen, the inner and outer borders of which mark the area for suture.

The two Hagedorn needles are now threaded at either end of a continuous silk suture. The first stitch, which

FIG. 2.

may be inserted before removal of the clamp, is placed at the apex of the triangle, and is tied at the centre of the thread. The clamp being removed the two needles are passed through from opposite sides at the same point—a cobbler's stitch (Fig. 2). Each stitch is pulled taut but not tied. The suture is continued in this manner at $\frac{1}{4}$ in.

intervals until the lower end of this side of the triangle is reached, where it is tied. With the scissors the redundant tissue is now clipped away at a distance of one-sixteenth of an inch from the line of suture (Fig. 3). The narrow ridge thus left is lightly touched with the thermo-cautery. The other two sides of the triangle are similarly treated, and the traction sutures are removed.

FIG. 3.

A suppository containing 1 grain ext. *opii* is inserted, and the usual rubber tube ($\frac{1}{8}$ by 3 in.), wound with iodoform gauze and well anointed with vasoline, is introduced (Fig. 4). This tube is left *in situ* until the morning of the fifth day after operation. The patient is kept on fluids for four days, and the bowels are constipated with *pil. opii* gr. 1 to 2 daily. At the beginning of the fifth day 1 oz. of castor oil is given by the mouth, and after four hours 6 oz. of warm olive

FIG. 4.

oil is injected through the tube, which is then gently removed.

In a series of twenty-one cases this operation has given satisfactory results.

I am indebted to Sergt.-Major H. E. Law (W.O.), C.A.M.C., for the drawings illustrating this article.

Memoranda :

MEDICAL, SURGICAL, OBSTETRICAL.

A CASE OF PUERPERAL SEPTICAEMIA TREATED BY INTRAVENOUS INJECTION OF EUSOL:

To the perusal of the article, "On a case of septicaemia treated by intravenous injection of eusol," by Drs. Lorrain Smith, James Ritchie, and Theodore Rettie, which was published in this JOURNAL on November 13th, 1915, we feel indebted for the successful treatment of the following case:

Mrs. C. H., aged 19 years, a primipara, was delivered of a male child on January 21st, 1916. The labour was very difficult, and was terminated by forceps under chloroform. Owing to the large size of the child, which weighed 10 lb., there was considerable laceration of the vagina and perineum.

On the third day after confinement the temperature was found to be 101°, while the lochia were very offensive.

The stitches were removed, the raw surfaces painted with pure phenol, and the vagina and uterus were douched with mercury biniodide solution (1 in 2,000), and aspirin in 10-grain doses every three hours administered.

On the evening of the same day the patient had a very severe rigor, lasting for two hours. Next morning the temperature had risen to 103.4° and the pulse was 132. The same local treatment was carried out, and next morning 10 c.cm. of polyvalent serum were injected; this dose was repeated the following day. Notwithstanding this the patient's condition became steadily worse.

On January 27th 120 c.cm. of eusol in normal saline, warmed to 37° C., were injected into the right median basilic vein, under local anaesthesia (1 per cent. solution of quinine-urea hydrochloride). Mr. A. G. Francis, Surgeon to the Hull Royal Infirmary, performed the operation.

Several hours later the patient became very restless, and complained of great pain in the back. A hypodermic injection of morphine $\frac{1}{4}$ grain, with atropine $\frac{1}{16}$ grain, hyoscine $\frac{1}{16}$ grain, and strychnine $\frac{1}{32}$ grain was accordingly given; sleep supervened in a few minutes and continued for several hours. Next morning the pain had entirely disappeared and the temperature had fallen 1.5°. Two days later it registered 99.4°, and reached normal on February 1st. The pulse, though still rapid (over 100), had greatly improved in quality. Previously of extremely low tension, it had now the character which an eminent French clinician so graphically described as *bien frappé*.

The local treatment adopted subsequent to that already described consisted in twice daily douching the vagina