and in these I always find associated changes in the lower ileum, and usually in the large intestine. In the normal cases the duodenum is small and short, and the bismuth is seen to pass through it by active peristalsis, without delay or regurgitation, into the jejunum as soon as the patient is placed in the supine posture from the right lateral position. Moreover, my results, both normal and abnormal, are repeatedly checked at operations, and the actual state of the duodenum is found to agree closely with my previous account of it. In a thin subject I have seen the duodenum dilated and showing strong "writhing" peristalsis though it contained no bismuth—in fact nothing but Benger's food.

4. "The larger the dose of bismuth the greater will be the delay in its passage through the intestines; consequently the intestinal stasis, if present, will seem to be greater than would be the case with ordinary food, and stasis may appear to be present when there is no stasis to ordinary food." The former part of this assertion is true to a slight extent (though the laxative action of the sugar of milk prevents delay in most cases), but as all my patients are given the same dose of bismuth (never less than 4 oz. in an adult), the normal time of passage is well known to me, and all my results are comparable. With a smaller dose it is impossible to obtain satisfactory pictures of the duodenum, the terminal portions of the ileum, the appendix, or even the large intestine.

5. "An emulsion does not fill the stomach sufficiently to give a good picture of its outline." "An emulsion does not mix uniformly with the gastric contents, but falls to dependent parts." The former assertion would be true if the emulsion were given on an empty stomach; this is not my practice. The latter statement is partially true; but it is true of almost all opaque meals, and no fallacy is introduced provided the observer checks his vertical and supine examinations with a view in the prone posture. The various changes of position—vertical, supine, right lateral, prone—ensure the proper mixing of the gastric contents with the bismuth.

By allowing the patient to take his usual meals throughout the investigation a true picture is obtained of the usual progress of the ingesta through the alimentary canal.

ADVANTAGES OF AN EMULSION.

The advantages of an emulsion over a solid meal are numerous.

(a) *From the Patient's Point of View.*—A smooth emulsion, slightly sweetened by the presence of lactose, is incomparably pleasanter, easier, and speedier to take than a bowl of porridge, or gruel, or bread and milk containing bismuth or barium. Many of my patients have been given one or other of these solid meals by other observers previously, and their verdict is absolutely unanimous. As a rule they volunteer the statement unasked. This refers to a porridge containing only 2 oz. of bismuth or barium; if 4 oz. were to be given in this way, the bulk of the meal would have to be so great that no patient could take it. In the case of barium sulphate, I find it necessary to give no less than 10 oz. of this substance in order to get the same pictures of the intestines as with 4 oz. of bismuth carbonate. Many patients (for example, cases of gastric ulcer) cannot or will not take a solid meal, or their doctor (very properly) will not permit it. A large dose of bismuth carbonate is decidedly soothing to the stomach and intestines. This is a property of great value, many of the patients being subject to nausea, vomiting, flatulence, colic, etc. It would be impossible to follow a test meal through the alimentary tract in some of these subjects but for the beneficent action of the dose of bismuth carbonate. It is a daily occurrence for a patient to volunteer the statement that he (or she) had a better appetite for lunch after the bismuth than had been the case for many months. There is certainly less flatulent distension during the presence of the bismuth in the large intestine, and even if there be no evacuation of the bowels for four days or more, the patients are able to tolerate it without discomfort, although they could not go so long under ordinary conditions without suffering from nausea, pain, distension, headache, etc.

(b) *From the Observer's Point of View.*—The time taken to eat a bowlful of porridge or bread and milk might well be spent more profitably, and doctors bringing patients have often complained to me of the loss of time inflicted on them in this way by some radiologists. The oesophagus

is not observed, and as a rule no examination of the chest is made, the observer concentrating his attention on the stomach at once. No view of the duodenum is obtained—a most important omission; this is due, as I have often explained, to the spasmodic contraction set up at the pylorus by a solid meal. The difference is most striking, for with an emulsion of bismuth carbonate given after a meal the duodenum is shown well filled with bismuth, and its behaviour may be studied with certainty and precision as the peristaltic waves pass along it, forwarding its contents into the jejunum in normal cases. The cheapness of barium sulphate does not compensate for the loss of these advantages.

CONCLUSION.

Those observers who are content to examine the stomach only, and do not seek information regarding the duodenum or the ileum, can give any opaque test meal they think best; in my own case, having come to the conclusion that the whole alimentary tract should be investigated in each case, I hold that an emulsion of carbonate of bismuth should be given—composed as stated in the early part of this paper—and administered in the manner there described, and the examinations should be carried out as I have described in my papers on intestinal stasis and gastric ulcer.^{2,3}

For the purposes of an opaque enema I am now in the habit of using 12 oz. of barium sulphate mixed with kaolin (*Bolus alba, German Pharmacopoeia*) and warm water.

"Butter-milk" is largely used in America in the composition of opaque meals; I have never tried it, but I imagine it would increase the acidity of the gastric contents, and so prevent the proper filling of the duodenum.

I am indebted to Dr. F. M. McPhedran, jun., of Toronto, for many valuable suggestions after reading the rough notes for this paper.

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SOME ACUTE ABDOMINAL CASES.

BY

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THESE cases have been seen recently, and I have considered them worth recording as acute abdominal conditions.

Cases Nos. I and II presented the usual symptoms of an acute abdomen, the remaining four had abdominal symptoms, which were acute and permitted no delay. The distinction I draw between the acute abdomen and those cases presenting acute abdominal symptoms is, with the former there is general peritonitis, due to some cause such as rupture of stomach or intestine either by disease or trauma, rupture of abscess, etc.; and the latter, where there is no general peritonitis, and the acute symptoms are caused by some form of internal strangulation of gut, cyst with twisted pedicle, ectopic gestation, intussusception, etc.; but in either group of cases the word "acute" means no delay. The difficulty of diagnosis is usually great, and is often made more difficult by delay and by the administration of some form of opiate.

CASE I.—General Peritonitis: Cause Doubtful.

E. H., aged 70, male, was seen, in consultation with Dr. Thomas, during the afternoon, with a history of an inguinal hernia, which had been reduced the same morning, but vomiting had continued with marked abdominal tenderness; the knees were drawn up and the pulse was 140. I considered that, although the hernia had been reduced, strangulation had not been relieved.

The patient was conveyed in a motor ambulance to a nursing home, and I operated at 8 p.m. the same day, assisted by Dr. Thomas.

Incision was first made to explore the site of the inguinal hernia on the right side. On opening the sac, thin, purulent, non-smelling fluid escaped. The wound was left open and a

drainage tube sutured in. A median subumbilical incision was then made; a quantity of the same fluid escaped. The pelvis appeared full; this was all swabbed out and a search made for a primary abscess. The appendix vermiformis was normal; some thickening of the sigmoid was felt and thought to be probably malignant, causing suppurative in the extraperitoneal cellular tissue, which had ruptured into the peritoneal cavity. The condition of the patient forbade further search. A large drainage tube was passed into the pelvis and another of the same size through a stab incision in the left iliac fossa. The central incision was then closed except at the lower angle.

The patient rallied well, drainage was free, and recovery, though slow and impeded by chronic bronchitis, was satisfactory.

The patient left the nursing home in six weeks. The central and right inguinal incisions firmly healed, but the discharge from the stab wound in the left iliac fossa persisted, and was occasionally faecal and needed dressing once in twenty-four hours. The bowels acted well, assisted by laxatives and enemata. He was seen three months later in excellent health; the sinus in the left iliac fossa was still discharging, but caused little inconvenience.

CASE II.—*Acute Peritonitis (Traumatic).*

E. G. H., aged 45, a strong, heavy-built man, was admitted under my care at the South Devon and East Cornwall Hospital with the following history:

Two days prior to his admission he was unloading some heavy crates, one of which struck him a glancing blow on the lower abdomen; this happened at 11 a.m.; he did not think much of it, and had his dinner at noon and worked on till 5 p.m.; pain then came on, which lasted through the night. He was admitted to hospital the next morning and was seen on admission. The abdomen was not distended, but was generally tender. The pulse was 120, but increased in a few hours to 140. The abdominal symptoms becoming more pronounced, I was asked to see him at 8 p.m.

It was quite evident that there was an acute abdomen, but the history was misleading, and I was at a loss to know what had happened. I therefore opened the abdomen to see, making the subumbilical median incision; a quantity of small gut with flakes of lymph on the surface, and much non-smelling, turbid fluid escaped on incising the parietal peritoneum; there was no free gas. The intestines were brought outside the abdomen, wrapped in warm towels, and carefully searched for injury, but the only sign of injury was some superficial ecchymoses on the lower ileum. Multiple enterotomies were made, and some pints of foul thin faecal matter was drawn off. The appendix was normal; drainage tubes were placed in the pelvis and both kidney fossae; the parietes were closed in layers.

Excellent recovery ensued, and he left hospital six weeks later. He was seen four months after leaving hospital in robust health, doing his usual heavy labourer's work.

I am strongly of opinion that the multiple enterotomies played an important part in the recovery of this patient, they certainly much facilitated the return of the intestines

CASE III.—*Dermoid Cyst of Ovary with Twisted Pedicle.*

E. C., aged 24, seen in consultation with Dr. Anderson, Bodmin, was six months pregnant. She complained of a sudden acute attack of pain in the lower abdomen twenty-four hours before I saw her. There was no history of indigestion or appendix attacks, and the pregnancy had advanced to its present date in a normal way. The fundus of the uterus could be made out just above the umbilicus, the abdominal wall was rigid; temperature 99° F., pulse 130. On vaginal examination a large semifluctuating tumour was found to occupy Douglas's pouch; it appeared quite separate from the uterus. Her condition was sufficiently acute to justify immediate operation.

Operation.

The patient was placed in the high Trendelenburg position and a 6 in. median subumbilical incision made; the pregnant uterus was pushed forwards and outside the abdomen, and the intestines packed up; a dark-coloured tumour occupied the pelvis and was connected to the right cornu of the uterus by a tightly twisted pedicle; light adhesions were sponged off, and the mass, which proved to be a dermoid cyst of the right ovary containing hair and teeth, delivered.

The manipulations had no effect on the pregnancy, which, Dr. Anderson reports, had a satisfactory ending at the ninth month.

CASE IV.—*Appendix Abscess without Localizing Symptoms.*

J. W., a young farmer, aged 35, I saw at a farmhouse in consultation with Dr. H. Davis of Callington, with the following history. He had been taken ill five days previously with vomiting and abdominal pain; a chemist prescribed some medicine; the symptoms continued, and Dr. Davis was called in. He found the temperature 100.6°, the pulse 120, the face flushed and pinched, persistent vomiting of a bilious character and faecal odour, the abdomen distended and tympanitic, with some dullness in the right iliac fossa; McBurney's point was very tender and the bowels confined. Dr. Davis considered it a case of appendicitis, and I was asked to see him next day. I found the abdomen board-like; the iliac fossae were resonant.

respiratory movement absent; there was marked visible peristalsis; rectal examination was negative.

Operation.

I regarded the case as intestinal obstruction, possibly due to appendix trouble but more likely to some other cause. I therefore made a median subumbilical incision; distended small intestine presented; this was packed away and search made for the cause of obstruction. With some difficulty the caecum was brought into view, and the appendix was found coiled up in omentum and enveloped in foul pus. This was dealt with in the usual way, the stump of the appendix buried in the caecal wall, the site of the abscess cavity drained through a stab wound in the right iliac fossa, and the central incision closed.

The central incision in this case was unfortunate, as it added to the difficulty of dealing with the appendix. The after-history is unimportant. The patient had quite recovered in six weeks.

CASE V.—*Appendix Vermiformis Strangulating Ileum.*

A healthy child, aged 3½, was seen in consultation with Dr. Webb of Looe, who informed me that the illness had begun a fortnight previously with constipation, vomiting, straining at stool, passing of blood and slime, and pain in the right iliac fossa. The case was thought to be an intussusception, and I was asked to see the child with a view to operation. The child looked very ill, the legs were drawn up, no tumour could be felt, as the abdomen was rigid. The history pointed to some acute obstruction, and probably an intussusception. An incision 3 in. long was made over the right rectus. On opening the peritoneal cavity no intussusception was found, but a loop of dark-coloured gut was seen lying in the right iliac fossa, and on further search it was found to be retained there by a tight cord which proved to be the appendix, which was adherent to the brim of the pelvis. The appendix was removed and the stump buried in the caecal wall. The nipped gut was in good condition; a large stercolith occupied the lumen of the appendix. There was no peritonitis, but the internal strangulation by the appendix caused symptoms similar to intussusception.

CASE VI.—*Retro-colic Hernia.*

I. B., aged 2½, had always been healthy till the present illness, which began three days before I saw the child with constipation, passing mucus and blood; there was some resistance in the right iliac fossa, and the right rectus was decidedly on guard. I was asked to see the child late at night by Dr. Reveley Clarke with a view to immediate operation. The child looked ill, having the acute abdominal aspect; it was evident that no time should be lost, and it was conveyed to the hospital, where I opened the abdomen two hours later. A small incision 2 in. long was made over the right rectus, with a view to diagnosis; the large intestine was collapsed, the small distended; the appendix and ileo-caecal junction were normal. The incision was enlarged upwards and a mass felt behind the caecum. Small gut was noticed entering the retro-caecal fossa; by gentle tension on this gut and pressure on the outside of the caecum 15 in. of ileum was delivered in fair condition. It was washed with saline and returned into the general cavity and the parietes closed.

The child left the hospital well in three weeks.

I regret I did not remove the appendix in this case; the retro-caecal fossa lies between the ileo-appendicular fold and the mesentery of the appendix, and would have been obliterated by removal of the appendix with its mesentery.

THE late Dr. F. W. Forbes Ross left estate valued at £1,677 gross, with net personality £525.

THE centenary of the discovery of iodine by Bernard Courtois of Dijon was celebrated in that city on November 9th, when M. A. C. Matignon, Professor of Mineral Chemistry in the Collège de France, delivered an address on the history of the discovery and on the development of the use of iodine during the century. Courtois actually made his discovery in 1811 when examining the waste liquors produced in the manufacture of sodic carbonate from the ashes of seaweed, but did not report it to the Académie de Sciences in Paris until 1813.

COLONEL GORGAS, who has accepted the invitation of the Chamber of Mines to advise as to the sanitation of the Rand, with special reference to the prevalence of pneumonia, sailed from Southampton on November 15th, and will proceed direct from Capetown to Johannesburg. He is accompanied by Dr. Darling and Major Noble, who are associated with him in the sanitary administration of the Panama Canal zone. On November 14th Mr. J. Howard McFadden entertained a party of guests, including Sir Thomas Barlow, Sir Francis Champneys, and Sir Ronald Ross, at a private dinner to meet Colonel Gorgas and his companions.