before they have extended through the coats of the bowel, the results are often most satisfactory. I have had quite a fair number of cases of resection of portions of the bowel for cancer which have shown no sign of recurrence after intervals of ten to twenty years.

SYMPTOMS.

Seeing that success mainly depends on removing the growth before it has perforated through the bowel coats, an early recognition of the symptoms is of the utmost importance. If in the rectum and within reach of the finger the diagnosis is easy, but if high up in the rectum or in any part of the colon the detection of a growth is much more difficult. The higher up the bowel the less are the symptoms; indeed, when high up the colon or in the ileo-caecal valve the onset of complete obstruction may be the first indication of anything seriously wrong.

When low down, as in the rectum, the symptoms are more suggestive. At first the bowels act two or three times a day at odd times. As the disease advances the calls to the closet become very frequent—anything from half a dozen to a dozen times a day. The patient on going to stool does not pass a real motion; more often it is only a few teaspoonfuls of mucus, dark by a mixture of motions and blood. Occasionally there is some bleeding without any motion with it. This is more commonly present in an early than in a late stage. The patient is troubled with wind, which he does not like to pass for fear of a mishap into his small clothes. When the sigmoid is affected the symptoms are much the same as in the rectum, but not nearly so pronounced. There is seldom any actual pain at the seat of disease, merely slight colicky discomfort from time to time all over the abdomen. Again, when in the colon, the constant desire to go to the closet is often absent, and there is less discharge. The reason of this is doubtless explained by the different habits of the rectum and colon. The latter objects very little to the accumulation of faeces within it; indeed, this is part of its function. On the other hand, the rectum resents anything being retained, and always has the desire to expel it.

In the 3 cases recorded the general symptoms were slight and not such as to suggest the patients were suffering from so fatal a disease as cancer. In Case III, when the operation showed a considerable mass of growth, the opening through which would scarcely admit the little finger, the symptoms were so slight that the patient described himself as feeling in perfect health, with the exception of occasional griping pains, and it was only because he noticed some blood that he sought advice. In any case, when the possibility of a growth in the colon is suspected yet nothing can be felt definitely by ordinary palpation, a thorough examination of the abdomen should be made under an anaesthetic. The assistance given by complete relaxation of the muscles is invaluable. In Cases II and III it was only after such an examination that a definite tumour could be felt, and the grounds for an exploratory operation with a view to removal of the growth justifiable.

THE OPERATION.

In resecting portions of the intestine, it seems to me a mistake to remove a V-shaped piece of the mesentery as generally recommended. It is obviously important that the blood supply should be as good as possible right up to the cut edges of the bowel. The entire blood supply

comes through the mesentery, the vessels anastomosing very freely just before they enter the bowel. No portion of the mesentery can be removed, therefore, without including some of the supply vessels. If instead of removing the V-shaped piece the attachment is divided close up to and parallel with the bowel, there is no risk of cutting off the blood supply except to the portion actually removed, and even this is utilized through the anastomosing circulation right up to the cut edges. In sewing the bowel together about one-fourth of its circumference lies between the two layers of the mesentery. It is this portion which requires the most accurate coaptation to get good union, as it is not peritoneal surface to peritoneal surface. To ensure accuracy this part of the circumference should be first united, the needle taking a good grasp of all the coats except the mucous membrane, only just the edges of which are included. The sutures (No. 00 silk) are tied so that the knot lies within the bowel. The remaining circumference of the bowel is united by Lembert's sutures, the knots of which are, of course, tied on the outer surface. After the two rings of the bowel have been united, a few sutures should be passed so as to bring the mesenteric surfaces together and make them continuous with the gut.

As to the after-treatment, it is well for a few days to trust to rectal feeding. The alternate sutures in the abdominal wound can be removed on the ninth day, the remainder three or four days later.

Two of the cases recorded convalesced without any trouble, full motions being passed after the first week, and up to the present time both patients remain in good health. The death of the third patient was not explained by the *post-mortem* examination. Every thing within the abdominal cavity was found in complete order. Not a sign of peritonitis and the junction was firm and completely watertight under high pressure.

These sudden deaths a few days after abdominal sections must be familiar to every surgeon of large experience. Fortunately they are comparatively rare, but I have had three or four such cases in upwards

of 2,000 abdominal sections. The symptoms are all the same. A patient who is doing perfectly well, with a normal temperature and pulse, suddenly sits up in bed, turns an ashy grey colour, with a slight gasping for breath, and falls back dead in a few seconds. It is generally supposed that these sudden attacks are due to a clot in the pulmonary artery, but I can only say, though a careful *post-mortem* examination was made, no such clot was found in any of my cases, so that some further explanation of these tragic deaths is yet required.

PERFORATED DUODENAL ULCER TREATED BY SUTURE AND GASTRO-ENTEROSTOMY.

By W. PAYNTER NOALL, M.S.LOND., F.R.C.S.ENG.,
YORK.

I WAS asked to see the following case in consultation by Dr. J. R. Lawther on the evening of January 4th, 1909:

L. W. W., a man aged 44, who was on a visit to York, was suddenly seized on the previous midnight with intense abdominal pain, passing to the right side and top of the right shoulder.

History.

He had washed out his stomach the same day, and as he had taken nothing since, that organ was empty at the onset of the pain. He had eaten little for a week, and had taken only milk

Fig. 2.—Cross-section of an involuted follicle of the same growth at point A, Fig. 1. Under high power.

and soda the two previous days. He stated that his health had been good till January, 1900, when pain came on after food at a regular interval of three hours, relieved by the next meal and also on the occasions he was sick. He also had acid eructations. On one night in October, 1900, the pain was severe. He vomited a large quantity of blood, had some loose black motions, and was a patient in a London hospital for three weeks.

From this date till June, 1904, every three months his symptoms would increase, the pain would be worse, he was constipated, had anorexia and loss of appetite, followed by vomiting, and relief with subsequent tarry motions. The vomit was sometimes black as well, but never alone.

From June to October, 1904, he could keep very little down; he consulted a physician, who told him he had a dilated stomach, and ordered him a special diet and lavage, which he had carried out up to the present. He remained in good health, exercising care in diet, till June, 1908, when he had a relapse of sickness and melaena, and also another in November, 1908.

When seen by me the patient was on his back; his expression was a little anxious and alert, the face pale and the tongue moist and slightly furred; he had a full pulse of 96 and the temperature was 99° F. There was no distension of the abdomen and the respiratory movements were present but their excursion diminished. There was some resistance over the upper part of the right rectus as well as tenderness (A) which extended downwards towards the appendix region. The liver dullness was diminished. The respirations were not hurried and there was normal vesicular breathing at the right base. On rectal examination no swelling or tenderness in Douglas's pouch was detected.

A diagnosis of perforation of a duodenal ulcer was made and an operation advised, consent to which was withheld till the next day.

Operation.

He was removed to the York Nursing Home, where, at 9.30 p.m., January 5th, a laparotomy was done, forty-two hours after perforation.

Under ether a vertical incision (B), 3½ in. long, was made through the upper part of the right rectus.

On opening the peritoneal cavity, a hissing escape of gas took place. Fluid, at first slightly turbid, with a few flakes of lymph, and then quite clear, welled up, and after mopping this up a cavity (shaded in figure) was exposed; it was lined with lymph, bounded above by the under surface of the liver and gall bladder and leading downwards and to the right as far as the appendix region. Separation of some adhesions between the commencement of the duodenum and the under surface of the liver revealed close to the pylorus a circular patch of lymph, the size of a sixpence, with a perforation ½ in. in diameter in its centre, situated on the upper and anterior surface of the first part of the duodenum. By retracting the liver and pylorus from one another, with some difficulty the perforation was infolded in a longitudinal direction with two rows of a continuous Lembert suture of celluloid thread. The stomach was filled with gas.

A posterior gastro-enterostomy was then performed, with the opening into the stomach made vertical, and the anastomosis with the jejunum as close to the duodeno-jejunal junction as possible, leaving no loop. The anastomosis was effected with two rows of celluloid thread, an inner one taking in all the coats of the stomach and jejunum, and an outer including the sero-muscular coats only.

The opening in the transverse mesocolon was sutured to the jejunum. Drainage was effected through a stab wound in the loin, and at the upper angle of the abdominal incision. Chromic catgut brought together the abdominal wall in layers, peritoneal musculo-aponeurotic, with additional supporting ones tied beneath the skin, and the skin edges with Michel's clips.

After-History.

The drainage tube and gauze were removed after thirty-six hours, and the clips on the fourth day. For the first twelve hours rectal salines were given, and after this feeding by mouth commenced. The pulse after the operation was 140; it fell to 100 the night after, and on the second night to 68. The bowels acted after an enema; physostigmine sulphate ⅛ grain was given hypodermically every two hours for four doses. There was no vomiting after the operation. In a month the patient left the home, having made an uninterrupted recovery.

As to his further progress, in answer to a letter of mine he wrote: "I have never had any pain or any sickness since I returned home from York. I can eat and drink practically anything now. My weight in overcoat was 10 st. 4 lb. about the middle of December last; now it is 11 st. 4 lb. in the same clothes. Every one tells me how well I look. After my past experience I can only say the sudden illness at York was really a great blessing in disguise."

In this case there was a nine years' history of ulcer; commencing with pain three hours after a meal, relieved

by the next meal, acid eructations, later haemorrhages, dilatation, intervals of good health under medical treatment, relapses, and finally perforation. Such a case may terminate in cancer, as a goodly percentage do.

Cases are on record where a duodenal ulcer and appendicitis have coexisted. The pain over the appendix in perforated duodenal ulcer can be explained on anatomical grounds. Maynard Smith¹ has shown experimentally that fluid escaping into the abdominal cavity through a perforation of the duodenum first fills up a cavity beneath the right lobe of the liver (the right kidney pouch), and then overflows, coursing downwards along the outer side of the ascending colon to the caecum. Hence the pain in this region.

Paterson² recommends gastro-enterostomy in all these cases if the patient can stand it, because it improves the after condition, lessens the risk where there is a second ulcer whether it has perforated or no, diminishes the risk of haemorrhage after operation, allows more efficient infolding of the ulcer, promotes more rapid and certain healing of the line of suture and so lessens the risk of further leakage, permits earlier feeding and earlier administration and more rapid action of purgatives, and so secures more efficient drainage of the peritoneal cavity.

The mortality depends mainly on three things: (1) Whether there is food in the stomach at the time of perforation; (2) the size of the perforation; (3) the time that has elapsed between perforation and operation.

In the case I record the stomach was empty, the perforation small (½ in.), and forty-two hours had elapsed between perforation and operation.

REFERENCES.

¹ Maynard Smith, *Lancet*, March 31st, 1906. ² Paterson, *Hunterian Lecture III*, 1906.

PERFORATED GASTRIC AND DUODENAL ULCERS TREATED SUCCESSFULLY WITHOUT SUTURE OF THE PERFORATION.

BY

EDRED M. CORNER, M.C., F.R.C.S.,

SURGEON TO THE CHILDREN'S HOSPITAL, GREAT ORMOND STREET;
SURGEON TO OUT-PATIENTS, ST. THOMAS'S HOSPITAL, ETC.,

AND

WALTER BRISTOW, M.B., B.S.LOND.,

LATE HOUSE-SURGEON TO ST. THOMAS'S HOSPITAL.

We bring forward these two cases because they both had simple convalescence, and in neither case was there any escape of food debris or any sign of gastric or duodenal fistula.

Both cases behaved as though the ulcers had been closed successfully—although this was not done—and, indeed, did just as well as successful cases in which we have sutured the ulcer. So much so, that it would seem that the time spent on unsuccessful attempts to suture a perforation may be wasted and militate against the patient's recovery—for speed of operating is undoubtedly one of the great essentials in bringing the treatment of peritoneal catastrophes to a successful conclusion. Every surgeon knows how often the stitches, inserted to close a perforation, cut through wholly or in part. If this occurs under his eyes, how often does it occur after the operation is finished? Indeed, many a case, treated successfully, in which the stitches closing the ulcers are thought to be secure, may be merely an example of what we have found—namely, if a perforation is merely "curtained" by omentum, recovery may ensue with no more troublesome convalescence than when the ulcer is closed.

The recovery after the non-suture of an ulcer shows how great a tendency there is in the material passing through a tube to flow along the tube, and not out of its sides. This is observable in the old method of performing colostomy when a lateral opening was made and the bowel not divided. In our cases there was no escape of digestive fluids although the perforation was merely "curtained." To prove that such a result does not always occur, even when the patients recover, it is merely necessary to quote: