abdomen and over the appendix caused no pain. By rectal and bimanual examination there was felt high up an indistinct fullness, nothing definite, and he did not complain of my hurting him. The only symptom that caused me any anxiety was his face; it wore an anxious expression. Leaving careful instructions that I was to be called if there was complaint of pain, I went into another ward. In less than half an hour the message came. The man was complaining of severe pain in the lower abdomen. I returned to him at once, and found that now there was very decided tenderness on pressure over the hypogastrium. My first examination had probably precipitated the rupture. As soon as possible I opened the abdomen, and found the end of a long appendix hanging over the brim of the pelvis. In the distal end were two concretions, and on the proximal side of the concretion a small perforation. He made an excellent recovery.

I might report many more illustrative cases. Unfortunately many of these are past relief when admitted to the hospital. This is largely due to the difficulty in diagnosis, and perhaps more to their deceptive course. A small perforation may occur, become walled off by adhesions, and lie in such a position that the usual examination of the abdomen does not detect it. How often the consulting surgeon is told by the family physician that at one visit the patient was to all appearances doing well and without ominous symptoms, and at the next visit evidenced more or less generalized peritonitis, and the patient in a semi-collapsed state!

On December 9th, 1904, I saw in consultation with Dr. W. Grant Stewart, a man 36 years of age, who gave the following history. Two years ago he had typhoid fever. This was followed by a condition thought to be tuberculous peritonitis. He was off work for seven or eight months. He described the onset of the present attack in the following words:

"Three days ago I was trying to lift a piece of machinery by using a plank as a lever, and resting my stomach against it. I was rather sore that evening, but was all right the next day, Wednesday. Early Thursday morning, while in bed, I vomited. Got up at the usual time, took a cup of coffee and a bit of toast, and went to the factory. Did not feel able to work, and started almost at once to return home. On the way I vomited from the rear end of the tramcar."

Dr. Stewart saw him at 5 p.m. on Thursday, and found him complaining of some epigastric pain; no marked tenderness. Temperature and pulse normal. The following morning his condition was much the same; temperature, 99.5°; pulse, 100. In the afternoon there was tenderness on deep pressure lower down over the pelvis; temperature, 100.5°; pulse, 112. When I saw him that evening the abdomen was somewhat rounded up, but there was very little tenderness at any point. Deep pressure over the pelvic region caused some uneasiness. By rectal examination the end of the fingers could feel high up an indistinct sense of a mass, which was tender, and, on pressing forward, he said that it hurt him considerably. There being no improvement in his condition on the following morning (Saturday), Dr. Stewart sent him into the hospital, where he could be kept under observation. At noon, Saturday, I examined him most carefully, and could make out no definite tenderness, except per rectum. There was no vomiting, and he felt much better, and asked for more to eat. There was present only two symptoms, slight abdominal fullness and rectal tenderness—these two symptoms and the clinical history. His temperature was 99° and the pulse 80. There was a good deal of distress in urinating.

I advised him to submit to immediate operation. "Well," he replied, slapping his abdomen, "I seem pretty well here, to have an operation, but I suppose you know best." Students and house-surgeons showed by their facial expression what they hardly cared to say—that I was most radical in advising an immediate operation with so few symptoms. On opening the abdomen I found an unusually long appendix. The proximal two-thirds seemed almost normal; the distal third dipped down over the brim of the pelvis, and was in part gangrenous, and contained a faecal concretion, on the proximal side of which was a small perforation. This diseased end lay in a small walled-off abscess. Perfect recovery.

On Monday, December 26th, 1904, a young man, aged 33, was brought to me by Dr. Edgar of North Hatley. The condition was thought to be appendicitis. The illness was of ten days' duration. There had not been much pain but a good deal of vomiting. He complained of discomfort amounting almost to pain when he vomited. At the onset there had been pretty general abdominal tenderness. Dr. Edgar said, "he had been tender everywhere except over the appendix." On admission to the hospital there was considerable distension of the abdomen, together with a moderate degree of rigidity. The only place where there was any tenderness was on very deep pressure over the pelvic region, and there it was very little indeed. There was certainly no tenderness over the usual situation of the appendix nor in the right loin. Per rectum there could be felt a distinct mass which was exceedingly tender. The slightest pressure of the fingers forward caused him to complain loudly and draw away.

Operation on the tenth day of illness and twenty-four hours

after recurrence of sharp pain. When I opened the abdomen with the patient in the Trendelenburg position, and the intestines pushed out of the way, I could see nothing abnormal on looking into the pelvis except that there were two coils of small intestine which, although somewhat reddened and rather distended, were evidently adherent below. After carefully protecting the general peritoneal cavity I gradually separated the coils of intestine from below and found a perforated gangrenous appendix lying in an abscess cavity behind the bladder.

In this case the caecum had slid down and become a pelvic organ. Pain and distress during micturition, especially towards the end of the act, are very generally complained of in this condition. Recovery is sometimes slow. The abscess walls are largely those of the true pelvis and are fixed and unyielding.

These clinical histories resemble each other in several particulars. There is the usual sudden onset of pain, and generally some nausea and perhaps vomiting. The pain is often more generalized than is usually the case. There will be only moderate elevation of temperature and acceleration of pulse. Tenderness on pressure, not marked, is complained of more when deep pressure is made over the pelvic region than over the more usual situations of the appendix. The diagnosis at the onset is probably appendicitis, but the attendant does not feel certain about it. In twenty-four or forty-eight hours the symptoms have improved, and the diagnosis becomes still more uncertain. Then there occurs quite suddenly after a period of two, three, or four days of an apparently normal convalescence, a sharp recrudescence, peritonitis develops, generally rapidly, and the condition of the patient soon becomes alarming.

My special plea is that a routine rectal and bimanual examination by fully establishing an uncertain diagnosis would suggest earlier operative treatment and lower the death-rate in this variety of disease.

In operating upon these cases I have found the Trendelenburg position of great value. The small intestines can be carefully protected and the deep pelvic cavity brought into view. In this way one is able to proceed to the different stages of the operation with much more assurance of not doing injury to the already inflamed parts and the infected area can be made clean with greater precision and certainty. Drainage is always necessary. Convalescence is usually slow. In only two instances have I thought it necessary to establish dependent drainage through the vagina. In one of these cases another surgeon had operated six weeks before and had carried a drainage tube from the bottom of the pelvis up through his lateral abdominal incision. A considerable cavity persisted with a good deal of purulent discharge. At his request and with his assistance I passed a tube up through the vault of the vagina into the pelvic cavity. We both thought that the dependent drainage was an advantage, but the cavity did not close entirely until three months later.

DIFFUSE PERITONITIS FROM PERFORATION OF THE APPENDIX: ITS DIAGNOSIS AND TREATMENT, WITH A RECORD OF 14 CASES WITH 12 RECOVERIES.

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In the *Bristol Medico-Chirurgical Journal* a few years ago¹ I published a paper on 40 cases of appendicitis, and in the September² number of the same journal one based on the records of 115 more cases. In the last series were 14 cases of operation for diffuse peritonitis and 6 of general peritonitis, and I purpose in this paper to give an abstract of the cases of diffuse peritonitis, and to make some remarks on their diagnosis and treatment. The first case was fully reported in the *Lancet* for 1901,³ and Cases III and IV in the *BRITISH MEDICAL JOURNAL* for 1902.⁴

It may be asked at once, What is the difference between diffuse peritonitis and general peritonitis? I think the difference is a very important one. By general peritonitis I mean cases in which the whole peritoneal cavity is involved; by diffuse peritonitis I mean a peritonitis spreading widely in the lower abdomen, and not merely

suppuration localized just round the appendix. Such cases are frequently called general peritonitis, but this is misleading, for if once the upper abdomen is involved the prognosis is much worse. In all my cases of diffuse peritonitis the infection was widespread, usually involving the pelvis and often the whole lower abdomen, without localization of the pus, yet it would not be correct to call them cases of general peritonitis. In my 6 cases of general peritonitis the mortality was very great; only 1 case recovered. There are every now and again cases in which from the very first the whole peritoneal cavity is involved, but in many the peritonitis is for a time confined to the lower part. Such cases I call diffuse peritonitis, and it should be our aim to check the spread of the infection before the upper abdomen is reached.

CASE I.

Mr. G., aged 44. Illness began December 4th, 1900, with right-sided abdominal pain, and this soon became very severe, and later on extended into the perineum and penis. There was no vomiting at any time. I saw him in consultation with Dr. Barrett Roue on December 4th. On the 6th there was more diffused abdominal distension and tenderness, though the pulse was only 80, and the temperature had never risen above 100°, and I decided to operate. Earlier in the case there had been rigidity and tenderness in the appendix region only. There was a history of three previous attacks within a year. On dividing the external oblique aponeurosis I found much oedema in the connective tissue beneath. On dividing the peritoneum a very red and distended caecum presented, and from beneath this I evacuated a small collection of pus, which was only retained there by the presence of surrounding distended coils of intestine. I next passed a sponge on a holder down into the true pelvis, and on withdrawing it a large quantity of thick pus escaped from the pelvis, which was then thoroughly sponged out. All the coils of intestine which presented in the wound were very red and had exudation of lymph on them. The appendix was perforated close to its attachment to the caecum, and I removed it. It was almost free from adhesions. A very long glass drainage tube was placed in the pelvis, another in the right loin, and a small one against the stump of the appendix, and gauze wicks were placed in the tubes. With rectal feeding only, for forty-eight hours, and occasional hot turpentine enemata, he progressed satisfactorily. The glass drainage tubes were changed for rubber ones, and these were left out on the fifth day. A few weeks after the operation recovery was complete.

CASE II.

Mr. N., aged 25. Seen with Dr. McKenzie, March 31st, 1901, on the sixth day of his illness. Pain severe at first, had continued, and there had been occasional vomiting. There was general abdominal distension and tenderness, and increased resistance in the lower part, but no lump or special tenderness in the appendix region; but per rectum there was a soft tender bulging. He was removed to the hospital, and I operated a few hours after first seeing him. His pulse was then 128, and he was inclined to get livid at times. I made the incision I usually make in such cases at the outer border of the rectus, low down, and found pus in the peritoneal cavity. I packed a sponge into the wound, and covered it with a clean carbolized towel, and then, after sterilizing the hands, and with clean instruments, made an incision in the linea alba above the umbilicus, to see if the upper abdomen was also affected. I did not find it involved. On returning to the lower abdomen I found extensive collections of pus in the right iliac fossa and pelvis, and lymph-covered coils of intestine in all parts. The appendix was completely gangrenous, and was removed. His pulse got worse during the operation, and he had two hypodermic injections of strychnine, but at the end it was much as at the beginning; his colour was very bad. He did not, however, live long after. As there was general abdominal distension and tenderness, and his breathing was interfered with, before operation, even though the higher incision did not reveal peritonitis in the upper abdomen, it is quite possible it was present.

CASE III.

L. M., female, aged 26. Seen with Dr. F. Peake, August 25th, 1901, on third day of illness, which commenced with pain across umbilical region, gradually increasing, and then becoming localized to appendix region. Vomiting had continued from the onset. Micturition caused much pain in the lower abdomen. The lower two-thirds of the abdomen was distended, tympanitic and very tender, and the breathing was entirely thoracic. Pulse 100 and fairly good. She was at the time I saw her in much pain, and the face was drawn and anxious. She was removed to the hospital, and I operated the same day. On opening the peritoneal cavity by the usual incision at the outer border of the right rectus, pus escaped which had been lying between the abdominal wall and some coils of very red and distended intestine beneath; much stinking pus was sponged up out of the pelvis, and a perforated appendix which had been lying over the pelvic brim, removed. I had to turn out several greatly inflamed and distended coils

to get at the appendix. All the coils seen were in this condition. I did not explore the upper abdomen as the physical signs of peritonitis had been confined to the lower two-thirds. Glass drainage tubes containing gauze wicks were inserted in various directions, after thorough sponging out. She was much relieved by the operation, but on the second day after it she had troublesome vomiting, although hot turpentine enemata and rectal feeding only were employed. After this she passed flatus freely and made a steady recovery. A month after the operation the wound was quite superficial only, and she was very well.

CASE IV.

A. W., male, aged 21. Seen with Dr. F. Peake October 1st, nine hours after the onset of the pain. The pain had been very severe in the appendix region, and vomiting very frequent, but the pain was lessening when I saw him. The right lower abdomen was very rigid and tender; there was no distension, and the rigidity and tenderness were strictly confined to the appendix region, but his breathing was almost entirely thoracic. His pulse was only 80, and his temperature normal. The case seemed to be an ordinary appendicitis, with severe onset. I advised operation, but he would not consent, until the pain became very severe again, and he was admitted to hospital fourteen hours after the onset. By this time the rigidity of the abdominal wall had become general, but there was no distension. Pulse was 112, and temperature had not reached 101°. I operated an hour after admission; on opening the peritoneal cavity free pus lying over the caecum escaped. The caecum was much inflamed and lymph-covered, and a very large quantity of pus was present in the right loin and the pelvis. The small intestine had not become greatly inflamed, but would doubtless in a few hours if the patient had not been operated on then. A perforated appendix, lying on the outer aspect of the caecum, was removed. After thorough sponging, glass drainage tubes with gauze wicks were inserted into the right loin and the pelvis. There was great difficulty in getting a discharge of flatus after the operation, though he was greatly relieved by it. Some vomiting returned on the second night. After repeated doses of calomel and hot turpentine enemata (some of which were retained), he at last began to pass flatus freely, and from this time he steadily improved. He was discharged a month and a few days after the operation, with only a small granulation spot on the scar.

CASE V.

W. H., male, aged 21. Pain began across the lower abdomen on the evening of March 6th, 1902, and had been increasing up to the time of admission. It had been more on the right than the left side. There had been no vomiting at any time. Micturition had caused hypogastric pain. He was first seen by Dr. F. Peake on the 9th, and sent by him to me at the hospital the same day. There was no distension of the abdomen, and no special tenderness, and no lump in the appendix region, but the lower third was very tender, and did not move with respiration, and a rectal examination revealed marked tenderness on pressure upwards. Pulse 100, and temperature 100°. Dr. Peake found it 102° earlier in the day. I operated a few hours after admission. There was pus in the pelvis and right loin, and red lymph covered coils of intestine occupied the lower abdomen. The perforated appendix lay in the pelvic brim, and I removed it. An incision in the linea alba did not disclose any peritonitis then. Every precaution was taken as to cleaning hands and using fresh instruments in making this incision. The lower abdomen was thoroughly sponged, and glass drainage tubes with gauze wicks inserted in various directions. The condition of the lower abdomen improved at once, but some distension, tenderness, and rigidity appeared higher up. This also soon subsided. He was fed at first by nutrients, and the usual hot turpentine enemata given to encourage discharge of gas. About a month after the operation he was quite well.

CASE VI.

Mr. T., aged 61. Seen in consultation with Dr. Barfield Adams, March 25th, 1903. He had had some pain in the right lower abdomen for about two days, but it had only been very severe that day. There had been no vomiting. The lower abdomen was distended and very hard and tender, and did not move with respiration. Earlier in the day, before the pain became so very severe, Dr. Adams had felt a lump in the right iliac region. Pulse 100, and temperature never above 100°. Operation was undertaken six hours after onset of the very severe pain. As the rigidity of the abdominal wall disappeared under the anaesthesia the lump could be again felt. On opening the peritoneal cavity pus escaped and more was sponged out of the pelvis. All the coils of intestine seen were inflamed and distended, and around the perforated appendix they were lymph-covered. The lump had been formed by some thickened omentum. The appendix was removed, and the usual sponging and drainage carried out. He did well from the time of the operation, and made a good recovery in about a month from that date. The usual rectal feeding and hot turpentine enemata were employed during the first few days after the operation.

CASE VII.

W. L., male, aged 19. Admitted to General Hospital at midnight on May 2nd, 1903, with a history of two days' illness. Pain at first all over the abdomen, had become localized to the

appendix region, and had increased from the onset. He had only vomited once after taking some brandy. I saw him first at 1 a.m. next day, and found the whole abdomen rigid and tender, and slightly distended, and the lower part did not move with respiration; pulse 96, temperature 99°. I operated at 2 p.m. As the abdominal wall relaxed under the anaesthetic a lump could be felt in the right iliac fossa. On opening the abdomen the condition present in most of these cases was found, free pus escaped, more was sponged out of the pelvis and the right loin, the coils of intestine seen were much inflamed, and the appendix was found perforated, and removed. An incision above the umbilicus did not reveal any infection of the upper abdomen. The sponging of the lower abdomen, and insertion of glass drainage tubes with wicks was carried out. The tenderness and rigidity of the abdomen did not return after the operation, but the distension became very great, though some flatus was passed, and there was not much sickness. However, he died on the third day after operation, and great distension of all the coils was found, with the exception of a few dark ones in his pelvis. No cause for the mechanical obstruction was found. There had been no spread of the peritonitis to the upper abdomen.

CASE VIII.

A. C., female, aged 43, was sent to me at the General Hospital, July 31st, 1903, by Dr. Brew of Chew Magna. There had been increasing pain in the right lower abdomen for three days, but no vomiting. There was tenderness and rigidity in the appendix region, and very little general distension was present. Pulse, 100; temperature, 100°. There was nothing to indicate more than a localized appendicitis. A vaginal examination only revealed some tenderness on movement of the cervix and none on pressure in the right lateral fornix, nor could any tenderness be made out per rectum. On opening the abdomen pus escaped, and was sponged up from all parts of the lower abdomen and pelvis, and the coils of intestine were inflamed and lymph-covered. The top of the appendix lay down in the pelvis and was gangrenous and perforated, and I removed it. During recovery from the abdominal condition she got some phlebitis in the left groin, but she was able to go home about a month from the operation. As to whether the scar was sound, or any sinus remained, the notes are not quite clear.

CASE IX.

F. T., aged 10, girl, was admitted to a medical ward at the General Hospital on January 7th, 1904, with the history that she was taken ill the previous night with abdominal pain and vomiting. On admission the pain was general, but tenderness had been localized in the right lower abdomen. I saw her on the 8th; the pain, but not the vomiting, had continued, and the child was frequently moaning with it. Pulse, 130; temperature, 102°. The whole belly was very tender, and the lower part was distended, but there was not any marked rigidity anywhere, and no swelling was present. I operated the same evening, and found free pus in the lower abdomen and pelvis, with inflamed and lymph-covered coils. The appendix lay over the right sacro-iliac joint, and I removed it. It was not perforated, but was inflamed with a patch of lymph in its wall and a sloughy condition of the mucous membrane at its tip. I could satisfy myself in this case that the peritonitis had not extended to the upper abdomen without making a higher incision. A large split rubber drainage tube, containing a gauze wick, was inserted as far as the bottom of the pelvis. The abdominal symptoms quickly subsided after the operation, but suppuration persisted for some time, although the appendix had been removed. She was discharged quite well two months after the operation.

CASE X.

A. S., aged 10, boy, admitted to General Hospital, April 1st, 1904, with history that pain began in the lower abdomen three days before with vomiting. When seen by me soon after admission he gave signs of pain at frequent intervals, and when asked where it was, always pointed to the left side of the lower abdomen. The abdomen was distinctly distended, and moved very little with respiration; the lower two-thirds were rigid and tender, and the tenderness was most marked in the hypogastrium. Pulse, 88; temperature, 100°. I opened the abdomen a few hours after admission and evacuated free purulent fluid, and found inflamed and lymph-covered coils occupying the right lower abdomen and pelvis. The appendix lay on the inner side of the caecum, near the pelvic brim, and around it was a collection of stinking pus, and another such collection in the pelvis. The appendix was removed and, after thorough sponging, split rubber drainage tubes were inserted in various directions in the lower abdomen. There was no return of symptoms after the operation, with the exception of a little secondary rise of temperature from re-collection of pus in the pelvis after the pelvic drainage tube had been removed, but the pus discharged, and he made a slow recovery. He left the hospital on May 20th, with only a small spot of granulation tissue in the scar.

CASE XI.

H. T., aged 21, male, admitted to General Hospital November 10th, 1904, with history that abdominal pain had commenced in the umbilical region thirty-six hours before; later on it had changed its locality to the appendix region. There

had been frequent vomiting from the onset of the pain. There had been pain with micturition in the hypogastrium. I saw him an hour after his admission to the hospital. He was in much pain in the appendix region, and tenderness was marked there, but the whole abdomen was board-like and slightly tender, but not distended. There was very little abdominal breathing, and although the abdomen generally was not very tender, pressure upwards, on rectal examination revealed marked tenderness. Pulse, 100; temperature, normal. I operated a few hours later, and on opening the abdomen, free pus escaped, and more was sponged up from the pelvis and left lower abdomen; the coils in the lower abdomen were inflamed and lymph-covered. A separate incision higher up in the abdomen (made with the usual precautions) did not show any extension of the peritonitis to that part. A perforated appendix, lying under the caecum, was removed, and the lower abdomen well sponged out, split rubber drainage tubes with gauze wicks being inserted. An ounce of solid magnesium sulphate dissolved in a little water was injected into the caecum through the stump of the appendix. This injection did not cause any action of the bowels, but he passed flatus freely after the operation. He steadily improved after the operation, and was discharged a few weeks later.

CASE XII.

F. A., female, aged 20, admitted to General Hospital, November 13th, 1904, with a history of five days' pain in the abdomen, which, after the onset, became localized on the left side, and frequent vomiting, nearly every day. The whole abdomen was tightly distended, but not rigid. Tenderness was not very marked anywhere, but was, like the pain, most marked in the left lower abdomen. No swelling could be felt in the abdomen. Rectal examination did not detect any swelling; there was some tenderness of and around the cervix. Temperature 103.4° F., pulse 120. I operated a few hours after admission, and on opening the abdomen pus escaped, and lymph-covered coils were seen to occupy the lower abdomen; a large collection of pus was shut up in Douglas's pouch, and another abscess lay over the right sacro-iliac joint. The appendix lay under the caecum and was perforated. It was removed. Lymph-covered coils were drawn down from even as high as the splenic region, but a sponge on holder introduced into the upper abdomen did not reveal the presence of any pus there. The lower abdomen was well sponged out and freely drained. There was a good deal of shock at the end of the operation. She had very free discharges of flatus and faeces after the operation with hot turpentine enemata, and even without, and her condition very rapidly improved; but her convalescence was protracted, and she was not discharged until the end of January, 1905, and then there was a line of granulation in the scar.

CASE XIII.

P., male, aged 22. Seen with Dr. Kerfoot at 2 p.m., November 23rd, 1904. There was a history of twenty-six hours' diffuse abdominal pain, which had been very severe at times, but had been relieved by opium. He had vomited several times. The whole abdomen was rigid and distended, and there was hardly any abdominal breathing. There was tenderness in the appendix region and a little in the hypogastrium, but no tenderness per rectum. Pulse 104, temperature 101° F. He was admitted to the hospital the same afternoon, and I operated at 5.30 p.m. On opening the abdomen a large quantity of pus flowed out and the coils in the lower abdomen were much distended, red, and lymph-covered, and several had to be turned out to give room for sponging. A perforated appendix was found at the pelvic brim, and was removed. An incision above the umbilicus revealed a little pus just under the incision, but a clean sponge on holder passed into the splenic and hepatic regions came away dry. The whole lower abdomen was thoroughly sponged and drained. Pulse was very bad at the end of the operation, but quickly improved. His condition steadily improved after the operation, and he was discharged early in January, but the scar was not quite sound then. It was so when seen again in March.

CASE XIV.

S. T., male, aged 17, was sent to me at the General Hospital by Dr. F. Peake, and admitted February 9th, 1905, with the history of four days' general abdominal pain and occasional vomiting, but he had continued work as a sailor up to the day before admission, and on that day came by train from Swansea to Bristol. Neither flatus nor motion had passed since the commencement of the pain. The whole abdomen was distended, and the lower two-thirds were both rigid and tender, and the epigastrium was the only part which moved with respiration. Every few minutes he would get a paroxysm of pain, then the abdomen would become board-like. Temperature 102°, pulse 112. There was a very tender hydrocele on the left side, which the boy said had only formed in the last twenty-four hours, though it had done so on several previous occasions. I operated a few hours after admission, evacuated pus from all parts of the lower abdomen, which was occupied by very distended red coils with lymph on them. Several coils had to be turned out before I could get room to reach the appendix, which was found perforated and lying on the inner side of the caecum, and was removed. Several coils of small intestine were firmly adherent to the back of the bladder by recent thick lymph, and one was twisted

into a volvulus and was quite empty. There was evidently mechanical obstruction in addition to the peritonitis. I wonder the boy had not been frequently vomiting. He became too bad during the operation to explore the condition of the upper abdomen; the lower abdomen was well sponged and drained. The fluid in the tunica vaginalis would not return into the abdomen with pressure. The prospect just after the operation seemed bad, as faecal vomiting, though not present before operation, set in next day, but it soon ceased, and from that time he passed flatus, and his abdominal condition steadily improved, and he was discharged in six weeks, with only a few patches of superficial granulation tissue in the scar. When seen again, in May, he was quite well and the scar sound. Soon after the operation, with a secondary rise of temperature, he got much pain and inflammatory redness of the left scrotum, and a considerable quantity of pus was evacuated from the left tunica vaginalis. This pus was as offensive as the pus from within the abdomen, and was evidently an infection through a very small patent funicular process.

It may be well to consider in what way the symptoms of this diffuse peritonitis either resemble or differ from those of well-localized appendicitis. In ordinary localized appendicitis the pain often begins as a general abdominal pain, or in the epigastrium, or the umbilical region, and only later on "settles," as the patients express it, in the appendix region; in other cases the pain begins in the appendix region. I may describe the position of the pain in exactly the same way in these cases of diffuse peritonitis. In some a general abdominal pain was present at first, and then "settled" in the appendix region, in others it was from the first in the appendix region, and in others, again, it remained from the first a general abdominal pain. There is, then, nothing distinctive in the position of the pain in these cases, although, if the pain remains as a general abdominal pain, it may perhaps be regarded as an indication of widespread infection, yet we must remember that it may be only a distinction of time, and we know how uncertain this may be. A very large number of cases of appendicitis with and without a widespread infection have general pain for a variable period. It is important to note that in Case XII the pain, which was at first general, became subsequently localized, not in the right, but in the left lower abdomen, and that the tenderness was also most marked there. The appendix lay on the right side, but there was pus in the pelvis, though no special focus of inflammation existed on the left side. In connexion with this case I may mention that I have operated on an appendix abscess on the left side of the abdomen. The appendix lay across the top of the sacrum, and the tip had perforated on the left side.

I should like to call attention to the remarkable position of the pain in Case I. It extended from the abdomen into the perineum and penis. There was pus in the pelvis. I have also known the rectum, the anus, and the testis, as the seat of pain in appendicitis.

In ordinary well localized appendicitis my experience is that in a few cases there is never any vomiting, but that in the majority vomiting occurs at the onset (sometimes with diarrhoea), and that in a small number it lasts for days. This was also so in these cases of diffuse peritonitis. It is a very significant fact that in no less than 4 out of the 14 cases there was no vomiting at any time, and we must not be misled into thinking that without vomiting the case cannot be a grave one. In the other cases the vomiting tended to persist more than it does in ordinary appendicitis. In ordinary well-localized appendicitis there is always some temperature found if a very careful record is kept, and the pulse is usually, though not always, increased in frequency. A pulse remaining at 120 and upwards we regard as a serious indication in an adult. In these 14 cases, when seen by me, there was very little temperature in several, though it may have been higher at an earlier period of the illness; in two adults the pulse was not more than 80, and in a boy of 10 not more than 88, and in some others not more than 100. Hence it is a mistake to suppose that a very serious infection of the peritoneum has not occurred if a patient's pulse is not above 80. This I pointed out when I published the records of the first few cases.

I have not referred in my abstracts of these 14 cases to the condition of the bowels. Sometimes there was absolute constipation, both as to flatus and faeces, but more often not; and we must not regard the passage of flatus and faeces as an indication that peritonitis is not extensive.

Then with regard to the physical conditions. In ordinary well-localized appendicitis the tenderness, if at first almost general, soon becomes localized to the right side of the abdomen, either over the ascending colon, if the appendix happens to lie under it, or to the usual position of the appendix; or, if the appendicitis is pelvic, it may be most marked on a rectal examination. But in these 14 cases in only 2 was tenderness confined to the appendix region; in several it was general, and in the rest over the lower abdomen. This diffusion of the tenderness, then, is of some value as a diagnostic sign. Of course, in estimating the extent of tenderness, we have to be very careful, for some patients say a part is tender when really all they mean is that it is not very comfortable to have any pressure made on it.

General tympanitic distension of the abdomen is rare in well-localized appendicitis, at any rate to a marked extent, though I have seen a very considerable amount present in this condition. In some of the 14 cases it was quite marked but was not present in all, and in a few was present only in the lower abdomen.

In well-localized appendicitis, if rigidity of the belly wall is present at all, it is confined to the region of the inflamed appendix, though this may be anywhere on the right side in the lower two-thirds of the abdomen. Rigidity in these 14 cases was a very variable sign; in several cases it was entirely absent, in some cases quite localized to the appendix region, in others general, and in others, again, only present in the lower abdomen. When present it does not always pass off when anaesthesia is complete enough to cut the skin, and the rest of the abdominal wall is quite relaxed. In most of the cases the abdomen moved with respiration much less than in the normal condition, and in a few hardly moved at all. Increased resistance on palpation is too indefinite to be considered in this analysis of the signs presented by the disease. The condition found on rectal examination is, however, of considerable importance. In one case the great tenderness on pressure upwards in any direction from the rectum largely influenced me in making the diagnosis of a serious diffuse infection. It is very necessary to distinguish any discomfort caused by the introduction of the finger and real tenderness on deep pressure from within the rectum; the latter is often felt as pain in the abdomen.

Then, again, in some of these cases a soft bulging swelling can readily be felt per rectum, in the position of a distended bladder, in the male, and in the same position in the female or in Douglas's pouch; when in the position of the bladder it may be needful to pass a catheter to make quite sure it is not a distended bladder; but it is usually much more tender, and there is not necessarily a dull hypogastric swelling. It is due to coils of inflamed and thickened bowel adherent in the pelvis, and such coils may or may not enclose a collection of pus, and you can rarely be sure from the feel of the swelling, though of course in very late cases it may be clear that fluid is present. On the other hand, in Case VIII a vaginal and rectal examination did not reveal the seriousness of the infection, and in Case XIII there was no tenderness per rectum, so that absence of tenderness per rectum may be present with an extensive pelvic peritonitis. In writing of the position of the pain in these cases of diffuse peritonitis I might have referred to the fact that it is not at all uncommon to get pain in the hypogastrium with micturition in both sexes, just as it is in pelvic peritonitis in women from other causes.

I think it will be evident from what I have written that often some of the classical signs and symptoms of peritonitis may be absent, and signs may be absent even in the lower abdomen; moreover, in Case VIII there was nothing to suggest anything more than well-localized appendicitis, nor in Case IV at the time when I first saw him, and in Case V it was only the marked tenderness over the lower abdomen and per rectum which indicated the serious nature of the case. I am quite certain that all cases of diffuse peritonitis cannot at an early stage be distinguished from well-localized appendicitis; that is, the gravity of the case, the widespread nature of the infection, cannot be told by the signs and symptoms present.

I do not intend to discuss the question of operation in appendicitis in this paper, as I have done so fully in another published last month in the *Bristol*

Medico-Chirurgical Journal, but I must point out that our inability to recognize the wide diffusion of the mischief in some of these cases must be taken into very serious consideration in deciding whether or not to operate on all well-marked cases of acute appendicitis. In none of these cases was there any definite swelling in the appendix region. As has been said by other surgeons, cases without such swelling are often the most serious. In one of the cases the appendix was not actually perforated (Case ix); it was inflamed and had lymph exudation on it, and the mucous membrane at the tip was in a sloughy condition. In another case although there was extensive suppuration in the pelvis yet the perforated appendix lay on the outer side of the caecum, showing that it does not always lie in the more dangerous position on the inner side when this serious infection occurs. In Case xiv the coils of small intestine were so kinked by adhesions to the back of the bladder that actual mechanical obstruction was produced.

I have recently published four other cases⁵ of mechanical obstruction associated with appendicitis, but this case was not included, as no vomiting was present at the time of operation, and therefore I thought we could hardly regard the case clinically as one of mechanical obstruction associated with peritonitis, though perhaps it might be so regarded. It is the only case with such a combination of conditions in which I have had a successful result after operation. In the same case it may be worth while to call attention to the occurrence of the suppuration in the tunica vaginalis in connexion with the abdominal suppuration.

The essential conditions of success in dealing with these cases of diffuse peritonitis are early operation, removal of the appendix, thorough sponging, and free drainage. "Early operation" is, perhaps, rather a vague term. I do not mean that unless we operate within twenty-four hours of the onset the patient will die; many of my cases show that operation several days after the onset may succeed; but it is most important to cut short the spread of peritonitis before it reaches the upper abdomen, for once it involves this part I feel sure the prognosis becomes very bad indeed. In all these cases I removed the appendix. There is no fear of breaking down Nature's barriers around the pus, as in cases of well-localized appendicitis. Nature has failed to form any such barrier, and the infection is spreading widely. In general peritonitis flushing may be a more effectual means of cleansing the peritoneum than sponging, but we must not flush these cases, or we may disseminate the pus into the upper abdomen. Our sponging, however, must be most thorough, and our drainage equally so. I have given up the use of glass drainage tubes in these cases. We often have to put long drainage tubes in various directions, and sometimes across the abdomen, and I believe that with glass ones used in this way there is a risk of a coil of gut getting caught under the tube. Possibly this was the cause of the obstruction found *post-mortem* in Case vii. A glass tube extending from an opening in the middle line low down into the pelvis would not cause such obstruction, but a glass tube reaching from an incision in the appendix region into the pelvis might readily do so. I always use a large split rubber tube, such as Mr. Mayo Robson has advocated in certain cases, in abdominal surgery, with a gauze wick inside; fluid, but not bowel or omentum, will readily enter the tube at any part, and they are more quickly prepared than the wick drains advocated by Moris of New York, which I used to use, and which resembled a cigarette made of gauze and oiled-silk "protective." I have given up the practice of injecting a purgative into the bowel through the stump of the appendix, as I find hot turpentine enemata given after the operation more effectual. I regard such enemata as a most important part of the after treatment. They must be as hot as the nurse can comfortably bear her hand in. In the first twenty-four to forty-eight hours after the operation I give nothing but a little water by mouth, and feed the patient by nutrients only, given every four hours, and half an hour before each nutrient is given, one of the hot turpentine enemata are given. The great thing is to get a free discharge of flatus. If you succeed the patient generally goes on well. In some cases, even if you give these enemata and calomel and saline purgatives

in large doses, you get no result for some time, and then usually after one or two thoroughly hot turpentine enemata gas at last passes, and the distension and vomiting subside. From the very first moment one of these cases comes under my care, all through the operation, and for many days after, I take care that the body slopes from the chest to the pelvis, in order that pus may not, by gravity at any rate, ascend to the upper abdomen. I usually make an incision through the outer border of the right rectus low down, so that both the pelvis and left lower abdomen, as well as the appendix region, can be reached, and if I fear the peritonitis may already have spread to the upper abdomen I make a separate incision above the umbilicus, in the linea alba, and explore. In order that this may be done without risk of infecting this region if not already infected, certain duplicate instruments and sponges are always prepared, the first wound is carefully covered over with a carbolyzed towel, and the hands thoroughly washed and carbolyzed again. It is best at once to close the upper wound and cover it with dry gauze and collodion. I admit that by making such an incision you cannot completely exclude the presence of peritonitis in the upper abdomen, but by pulling on the transverse colon and the stomach, and putting a clean sponge on holder up into the splenic and hepatic regions, you may pretty well tell whether it has reached the upper part or not.

It is impossible to increase the length of this paper by details of the 6 cases of general peritonitis due to disease of the appendix which occurred in the same period of time. In the one which recovered there was what might almost be called an "ascites of pus." Free sponging and drainage, together with removal of the appendix, was carried out. All the fatal cases could probably have been saved if operation in an earlier stage had been possible. In one of the fatal cases the patient was thought by the doctor in charge of the case to have almost recovered from an attack of appendicitis, when an abscess at the pelvic brim ruptured and set up a peritonitis general from the first; in another the patient was supposed by the medical man in charge to be going on quite satisfactorily in an ordinary attack of appendicitis, when general infection occurred; in yet a third the patient was under medical treatment for four days without recognition of the serious condition present, and I only got the chance of operating on the fifth day; in another case three days were lost before operating, as the case was under treatment before admission as one of lead poisoning; and the fifth fatal case was not operated on until the fourth day, as the day before she was supposed by the doctor who attended her to be decidedly better. Several of these cases show how dangerous an infection may occur when the patient either seems to be progressing favourably, or even improving, and should be remembered by those who think it is always easy to tell when a case of appendicitis is serious or is "going wrong."

REFERENCES.

- ¹ 1900, p. 330. ² 1905. ³ Vol. i, p. 1134. ⁴ Vol. i, p. 225. ⁵ *Bristol Medico-Chirurgical Journal*, September, 1905, p. 227.

MEDICAL ROLANDS AND PHARMACEUTICAL OLIVERS.—Two hostile petitions are being circulated in Iowa for signatures, and will later be presented as Bills before the State legislature. The medical practitioners pray that pharmacists be restrained from counter prescribing, while the pharmacists ask that doctors be forbidden to make up prescriptions.

THE CARE OF EPILEPTICS.—At the fifth annual meeting of the National Association for the Study of Epilepsy and its Treatment, held at New York Academy of Medicine on November 29th, 1905, the President of the Association, Dr. W. P. Spratling, of the Craig Colony at Sonyea, New York, said there are in the United States 150,000 sufferers from epilepsy, 14,000 of whom live in the State of New York. Less than 1,100 of that number are at present under treatment in the Craig Colony, where the want of additional accommodation is making itself urgently felt. Epilepsy, said Dr. Spratling, can be cured in a considerable proportion of cases if the disease is taken in time and treated properly for a period of two or three years. A special report was read which showed that satisfactory progress is being made in the United States in the management of epilepsy. Legislative action in the matter has been taken by the States of Ohio, New York, Massachusetts, New Jersey, Pennsylvania, Texas, and Indiana.